

THE AUTOMOBILE

WEEKLY

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MILITARY TESTS OF TRACKLESS TRAIN.

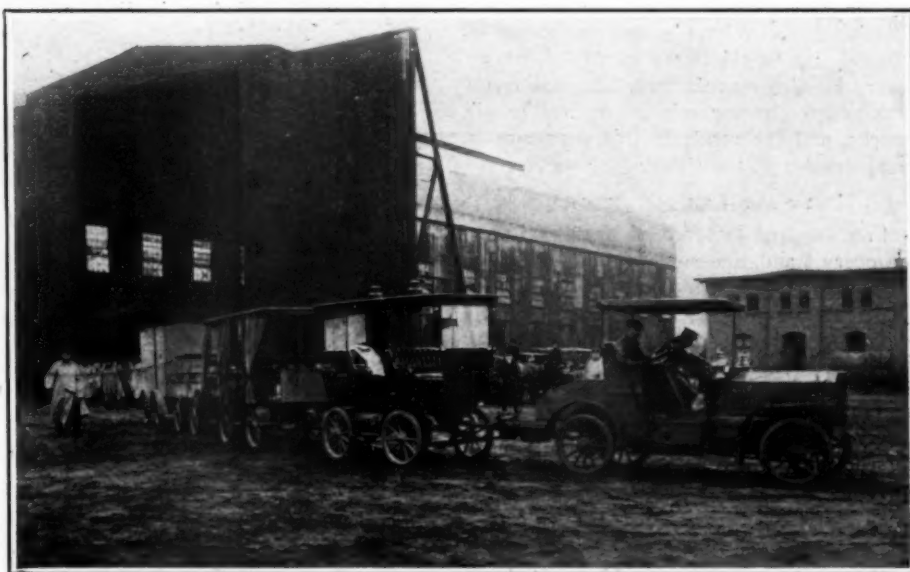
THE recognition of the vast possibilities of the automobile for army use has been even more rapid than its appreciation for ordinary commercial ends, and the primitive experiments of two or three years ago with ordinary touring cars and trucks have produced a large number of special vehicles for military uses. The war departments of the great nations are already on the alert to avail themselves of the latest developments in this special field of motoring.

The Renard automobile train, the invention of a French officer, was introduced at the Paris show of last winter, and has since been in practical operation in France. One of these trains has been ordered by the German War Office, and recently made its way by road under its own power from Paris to Berlin.

Upon arrival at the German capital the train was very thoroughly tested in a series of maneuvers in the presence of the Minister of Agriculture, Herr von Podbielski; the Chief of the General Army Staff, Count von Schlieffen; the Quartermaster General, Lieut.-General von Moltke; the Chief

Starting from the military balloon depot, the train was fully explained by the president of the German Officers' Club, Herr

ground of Berlin, and run successfully over rough ground. It is probable that the new train will find a place in the rapidly grow-



RENARD AUTOMOBILE TRAIN EMERGING FROM GERMAN ARMY BALLOON SHED IN BERLIN.



DEMONSTRATION TO SHOW HOW EACH CAR FOLLOWS IN TRACKS OF LEADER IN TURNING.

Quartermaster, Lieutenant von Gayl; Count von Merbach, of the Upper House, and staff officers of the War Office and the railway and traffic regiments.

von Wedel, and by M. de Pomian, representative of the builders, and some practical tests were made, after which it was taken to the Tempelhofer Field, the big drill

ing automobile division of the German army.

In the Renard train the first car is a strongly built automobile, with a Darracq motor of 60 horsepower, driving on the rear wheels in the usual manner, and also carrying a supplementary shaft fitted on the rear end with a coupling and universal joint. Each individual car of the train is similarly fitted with a section of shaft for its full length, with a universal coupling on each end, this shaft being geared to a second short shaft, which in turn drives the rear wheels in the usual way. In this way there is no traction on the part of the motive car, and consequently no need for the great weight and heavy wheels required in the old type of traction motor.

The steering is effected in a similar manner, each following car being positively steered in the track of its leader, by means of shafts and gearing controlled by the driver of the motive car. The train as a whole is thus under far more perfect control than where the cars are merely drawn after a tractor.

Motor Exhibits at the Stanley Show.

First London Exhibition of the Season Reflects Growing Popularity of Motorcycles, "Tri-Cars" and Light Automobiles.

Special Correspondence.

LONDON, Nov. 26.—The twenty-eighth annual Stanley Cycle and Motor Show was opened at the Agricultural Hall, London, on Friday, November 18. Although in reality a cycle show, the motorcycles, and in a few cases motor cars, staged by some of the exhibiting firms, give it a claim to the added title of motor show.

In England the sport of motorcycling has taken hold of a rapidly increasing section of the community; in fact, from a government return it appears that in the first half of this year more than 30,000 motorcycles were registered, surpassing the number of motor cars by several thousands. Consequent to this state of affairs, nearly every English manufacturer of pedal cycles has added a motorcycle department to his works, and the result of this departure is very evident at the show.

HEAVY AND LIGHT MOTORCYCLES.

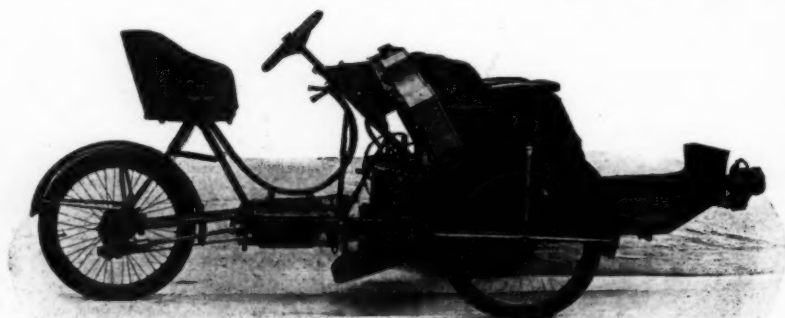
Single-seated motorcycles are to be seen on every stand, and some are quite worthy of note. The Humber Company has a complete range of models fitted, as usual, with chain transmission. The 3-horsepower machine, weighing about 160 pounds, and capable of speeding up to forty miles an hour, is retailed at £45 (\$225), and seems a very popular mount. As a contrast, a 2-horsepower model, weighing only seventy-one pounds when ready for the road, is on view.

Other firms follow in line, most of them having a heavyweight machine of about 3 to 3-1-2 horsepower, with a 2-horsepower model weighing less than 100 pounds. The

average prices range from £35 to £45 (\$175 to \$225).

The Belgian Minerva Company, although not an English firm, has many models on exhibition and its machines are most frequently seen on the road. This time the company has quite astounded the English motor trade by retailing its machines at £27, £29 and £32 for the 2 horsepower, 2 3-4 horsepower and 3 1-2 horsepower, respectively. One of the novelties in the motorcycle line is the 4-horsepower "F. N." machine, made by a Belgian firm. This has four small vertical cylinders in line, and the magnificent finish combined with the com-

outside diameter flywheel carries the friction clutch and from here the power is taken to the gear box by a shaft with universal joints, to allow for any springing of the frame. Within the gear box are three gears of the usual Panhard sliding type. From the gear box a propeller shaft leads to the rear wheel, which receives the drive by means of a worm, or skew, gearing. Foot pedals are fitted to work the clutch as on a car, and also an enclosed expanding band brake on the back wheel. A side lever changes the speeds and a similar lever sets the brakes on the front wheels. Steering is by wheel, the column being supported on ball bearings, and is of the irreversible Ackerman type. A large bucket seat, well suspended on springs and upholstered, is provided for the driver, and a long and comfortable carriage for the passenger in front. Pneumatic tires, size 2 1-2 inches, are fitted to the wheels, which are covered by wide mud-guards. Many other excellent



GARRARD 8-H.P. "TRI-CAR," A TYPE OF VEHICLE POPULAR IN ENGLAND.

paratively low price of £48 makes this a popular motorcycle.

Leaving the motorcycles pure and simple, we come to a kind of hybrid, which has a position between the motorcycle and the small car. This is the "tri-car," or "fore-carriage," a type of three-wheeled car, steering with two wheels in front and the single rear wheel taking the drive of the engine. The driver sits over the back portion of the machine, while the passenger is seated in a well-sprung basket chair between the front wheels. This type of motor has so far advanced in public favor during the past two years that it is now a serious rival of the small car of 6 horsepower or thereabouts, which type the fore-cars easily surpass in point of numbers. Perhaps a description of one of the most up-to-date models would be of interest to American readers.

THE GARRARD TRI-CAR.

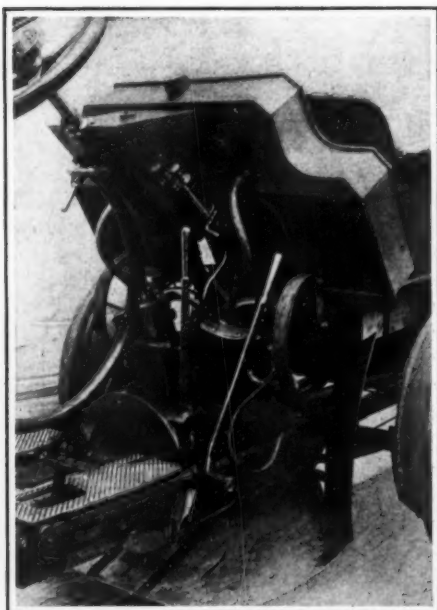
The Garrard tri-car is made by the Garrard Engineering Company, of Birmingham. Power is supplied by a two-cylinder engine, set athwart of the front part of the frame. Each cylinder is 85 mm. by 85mm., bore and stroke, and the engine develops 8 horsepower on the brake. The cylinders are water cooled, pump circulation with tank and radiators being adopted. The 14-inch

devices are fitted, among which are two sparking plugs in each cylinder, so that if one fails the other can be switched into use. There is also a wipe contact breaker, which by means of bevel gears and a long shaft runs on the center of the steering wheel, so that the rider has the engine ignition under his notice continually. This machine weighs complete about 460 to 480 pounds and is priced at £130.

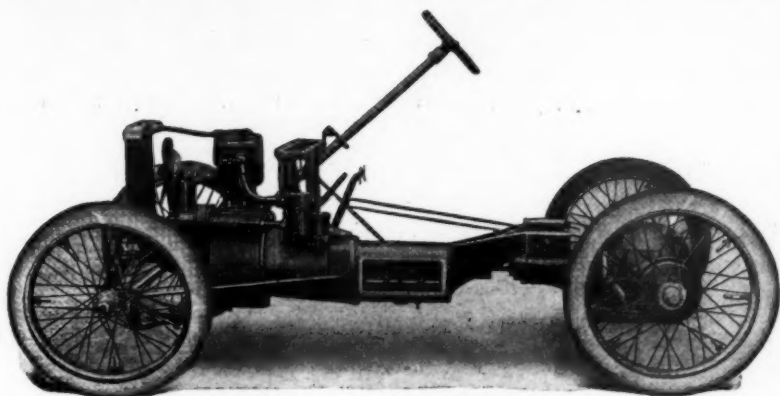
This type of machine is extremely popular and one or more are to be seen on nearly every stand.

ROVER LIGHT CAR.

Owing to an agreement made by the promoters of the Stanley show with an opposition firm, only a limited number of cars are displayed. Several of those shown are well worth examination, and in particular the Rover light car is very interesting. This car, made by the old established Rover Cycle Company, Ltd., of Coventry, made its first appearance in the light car trials at Hereford, at the end of last August, where it was put out of the running by a broken timing wheel, after doing very well for two days. The car possesses many unique features, the most notable of which is that it has no frame. The engine, gear-box, shaft casing and back axle casing form one continuous girder. To the front



GARRARD MOTOR, TANKS AND RADIATOR.



UNIQUE CHASSIS OF ROVER FRAMELESS ENGLISH LIGHT CAR.

of the engine the axle and front wheels are pivoted on a swivel bearing, on which also the front portion of the body is suspended, the rear part of the body being supported on springs attached to the casing of the back axle. The engine has a single water-cooled cylinder of 112 mm. bore and 125 mm. stroke, developing 8 horsepower at 900 revolutions, although it can be accelerated above this speed. Three flywheels—two inside of the aluminum crankcase and one externally fitted—are used, their total weight being more than 120 pounds, or one-eighth of the total weight of the car. In this way a very steady running engine is obtained, with good hill-climbing powers. The crank bearings run on ball races, and ball bearings are used throughout the car wherever possible.

The cams working the valves are very interesting; normally, the valves work in the usual manner, but by an ingenious mechanism the cams are altered and the lift of the valves is gradually reduced till the engine is running at any desired speed. By a further change the engine sucks air in every time, and, as the air is compressed at every alternate stroke, the engine acts as a powerful brake. Ignition is effected in

the usual way by means of accumulators and coil. The water circulation is maintained by means of a double-bladed propeller pump, and so efficient are the radi-



HUMBER 8-10-H.P. FOUR-CYLINDER LIGHT CAR WITH THREE SPEEDS.

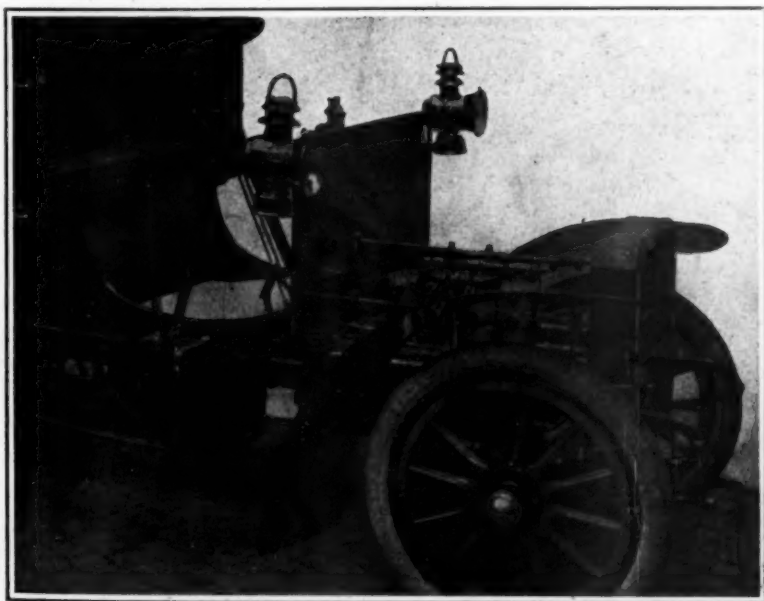
ators that only one-half a gallon of water is carried.

From the engine the power is transmitted through a metal-to-metal clutch to the gearbox, where sliding gear wheels provide three

speeds forward and a reverse. Thence a shaft transmits the power to the differential by a bevel gear, which drives the live rear axle.

Other notable features on this car are the steering, which is worked by wires from the bottom of the steering column, and the Rover automatic carbureter, which provides a uniform mixture to the engine at varying speeds. A tank carries five gallons of fuel, enough for 200 miles over ordinary roads. The weight of this car complete is 10 1-2 hundredweight (1,050 pounds), and the price is £200, with two-seated body.

This car will climb all ordinary grades on top speed, and on first speed will mount a 20 per cent. gradient. With ordinary gears a Rover car reached a speed of thirty-two miles an hour at the Blackpool trials. Great interest is centered in the Rover exhibit at the show.



ENGINE AND CONTROL MECHANISM OF HUMBER THREE-PASSENGER CAR.

HUMBER FOUR-CYLINDER LIGHT CAR.

Another light car exhibited for the first time, and which is of interest, is the 8-10-horsepower Humber. This car has a four-cylinder engine—an unusual feature in light car construction—which develops 10 horsepower on the brake. An aluminum clutch covered with leather is contained in the flywheel, and by a simple device four points project and give gradual engagement, thus preventing jerking when starting. The transmission is entirely by gear. The Panhard type change speed gives three speeds of eight, eighteen and thirty-two miles an hour, and a low speed reverse. The frame is tubular and combines rigidity and strength with lightness. Gasoline sufficient for 150 miles is carried in a tank under the seat, and all important moving parts are oiled from a pressure sight-feed lubricator fitted on the dashboard. The standard type of body holds three persons, having a seat for the driver and two at the rear, which are reached by passing the driver's seat from the front. Artillery wood wheels, size 28 inches by 3 inches, are fitted with Michelin tires as standard. The car has powerful brakes. The total weight is only 11 1-2 cwt. (1,150 pounds).

This car has been run for some months on the road, and is now quite out of the experimental stage. The price of the standard car is 225 guineas (\$1,180).

STAR TWO-CYLINDER CAR.

The Star light car should also be mentioned. This is fitted with a 7-horsepower, two-cylinder engine, with automatic governor. Three speeds and reverse are provided by sliding gears and power is transmitted to the rear wheels by side chains. The frame is made of wood, strengthened with steel flitch plates, and wooden wheels with three-inch tires are on the standard model. This is a car which has given much satisfaction to its users, and gained an award in the light car trials. The price is £175 for two-seated body, and £190 with accommodation for three passengers.

The Siddeley 6-horsepower car, similar to the one which gained a gold medal at the Hereford trials, is on exhibition. It is listed at £175.

The rest of the motor exhibits consist of Horbick, Clement-Talbot and Darracq cars, of which last many fine specimens are shown.

The cars exhibited at this show are only a few examples of the English small car industry, which is rapidly rising in importance. At the Crystal Palace show in January, and the Olympia show in February next, light cars will be present in great numbers, and all the 1905 models will then be on view.

French Comment on the Show.

Special Correspondence.

LONDON, Nov. 20.—As a rival to the coming Paris show, with its array of gorgeous exhibits, the present London show would stand a very poor chance. There are, however, at "the Hall," as the Londoners call the Agricultural Hall, where the Stanley show has been held as long as the cycle and motor trades have existed, a great many novelties or improvements on old things which do not lack of interest.

Without going into a detailed description of the exhibits, one may note the general tendency, as the English people show in motor design the same uniformity of general practice which has always characterized their work in the cycle trade.

The general impression of one who has watched the development of design in England in all lines of the automobile industry is that of increased complication; having as an excuse, and a very acceptable and real one at that, increased efficiency.

The motorcycles, which last year were rather underpowered, and could not take their rider up any reasonable hill, are now ranging from 2 3-4 to as much as 4 1-2 horsepower nominal, and any of these mounts can now take its driver without pedalling anywhere a horse and carriage can go.

The general lines of all English motorcycles, which are also those of practically

all French ones, include a vertical high-powered engine, as near to front wheel as possible in order to obtain long and efficient belt drive; bottom bracket or pedal hanger well behind in ordinary cycle position, but with extra large width and chain line, 28-inch wheels, 2 1-4-inch tires, 24-inch frame.

The improvements which mark the difference between the various firms are automatic or mechanical inlet valve, the latter seeming to have the preference; magneto or accumulator ignition, the former, although in lesser number than the latter, seeming to have made great progress and to be about to carry the market; chain drive with two speed sliding gear change speed combined with bottom bracket; spring forks or seats, automatic carbureter.

The average weight of these machines is 125 pounds, and the average power 3 1-2 horsepower, average fuel capacity, 150 miles, most being machines with a long wheel base and a high frame.

The greatest novelty of the year is, however, not the new and improved motorcycle—which in fact seems to be on a decline on account of a pretended lack of sociability—but the "tricar."

American readers will not be slow to appreciate the lack of mechanical efficiency of these machines, the price of which is often higher than that of the average American runabout; and which are hardly any more sociable than a motorcycle and trailer, while much less so than a motorcycle and side carriage.

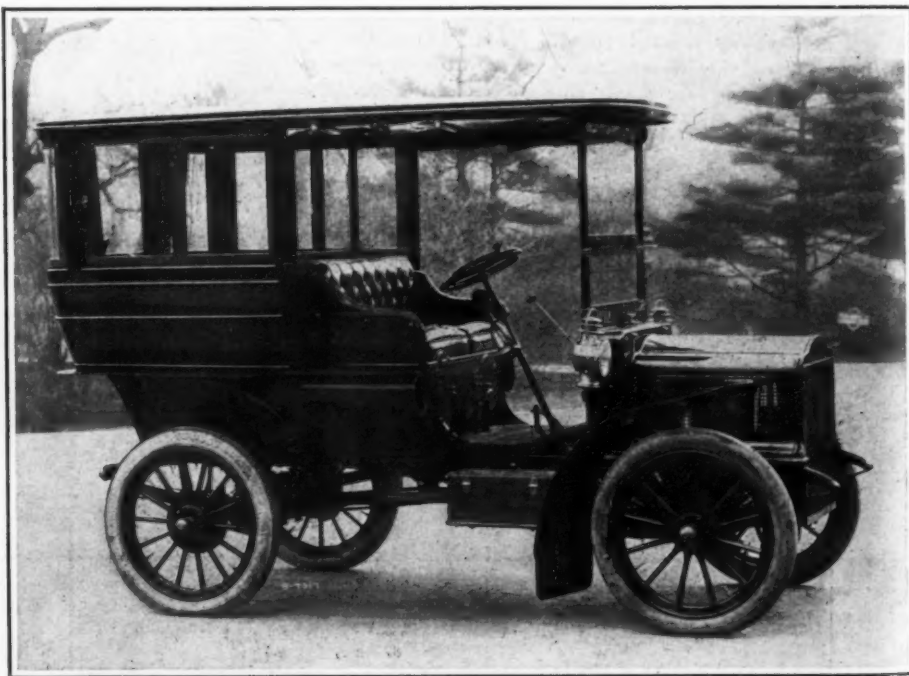
It is a wonder to all disinterested minds how the craze for such a vehicle has come

to a whole country, and it is a question which all of any experience ask themselves as to how long this fad will last; as it is to be hoped that it will prove to be only a fad.

When one remembers the utter failure of the Bollée three wheelers of six years ago, of which some of the tricars of to-day are almost exact copies, although their designers may not know it, one is simply frightened at the future of firms risking their entire capital in the manufacture of such things. It may be that these fears will prove entirely erroneous, but they are at any rate the expression of the ideas of many experts, both French and English, and might well be considered by all engaged in the manufacture of such vehicles.

The few light cars exhibited do not show much originality; they are mere copies of larger cars, built on well known principles and simply reduced both in size and quality in order to obtain relative cheapness; and are at the same time sold at a price a good deal higher than that of the average American runabout.

British Patent Office rules will, after January 1, 1905, be subject to an amendment providing that when an application for a patent has been made, the examiner shall, in addition to the inquiries he is directed to make by the Patents Act of 1883, investigate for the purpose of ascertaining whether the invention claimed has been claimed or described, wholly or in part, in any specification other than a provisional specification not followed by a complete specification, in any application for a patent in the preceding fifty years.



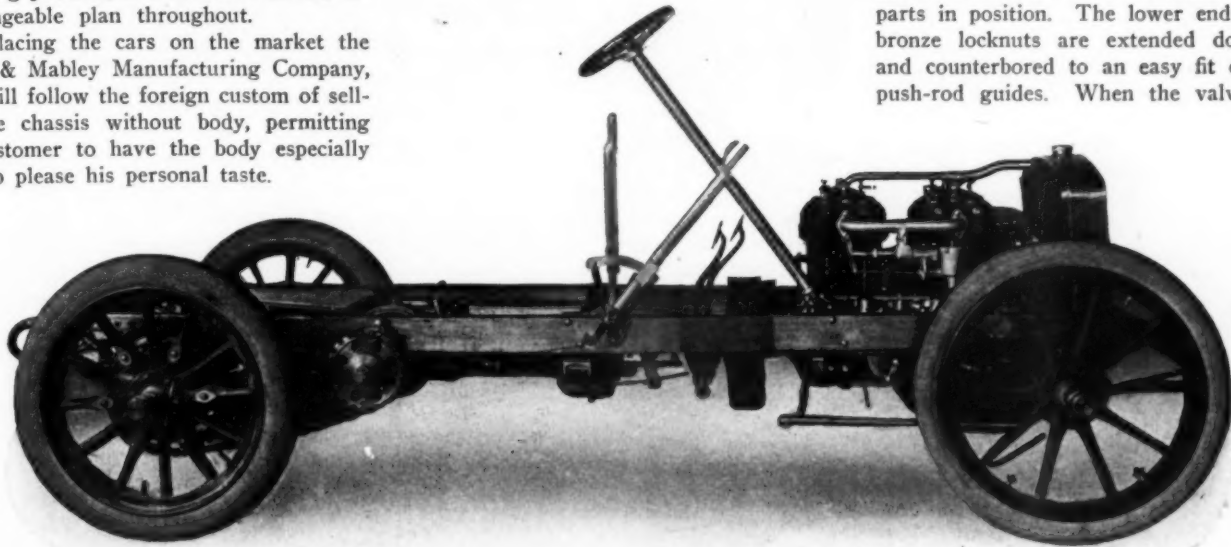
The engraving above is from a photograph of a 1905 model White steam car, fitted with limousine body, to the order of Charles A. Starbuck, of New York, to whom it was delivered last week. The interior seats four persons comfortably, is handsomely upholstered in Russian leather, and is illuminated at night by means of electricity supplied from a storage battery on the car. The windows are fitted with black silk spring roller curtains.

Simplex 30-H.P. Touring Car.

WORK is actively in progress upon a first lot of forty Simplex touring cars of 30 horsepower, built in design and construction like the 75-horsepower S. & M. Simplex special racing machine driven by Frank Croker in the Vanderbilt Cup race, except as to size and the slight changes necessary to adapt them to the different purposes. The severe testing that the racing car received has been of great value to the builders in getting out the touring car, although it is stated that the trials of the racing car served mainly to verify the correctness of the work already done.

The Simplex cars, which are about to make their initial appearance before the public, are of the four-cylinder vertical engine type, embodying what the designers believe is best in foreign and domestic engineering practice, and are built on the interchangeable plan throughout.

In placing the cars on the market the Smith & Mabley Manufacturing Company, Inc., will follow the foreign custom of selling the chassis without body, permitting the customer to have the body especially built to please his personal taste.



CHASSIS OF NEW 30-HORSEPOWER FOUR-CYLINDER SMITH & MABLEY SIMPLEX TOURING CAR.

Facilities for making every part of the cars are provided in the company's shops at 614 East 83d street, New York, with the exception of castings and a few special parts.

The chassis of the touring car, complete without body, weighs slightly more than 2,400 pounds. The wheelbase is 105 inches and the tread is standard. Drive is by side chains from a countershaft to the rear sprockets, and four forward speeds of approximately eleven, nineteen, twenty-nine and forty-one miles an hour are provided with reverse at eight miles an hour, the motor running at 1,000 revolutions a minute, and with standard touring sprockets.

FEATURES OF CYLINDERS AND PISTONS.

The motor is similar, in its main features, to the Smith & Mabley marine motor, of which a lot of thirty is being put through simultaneously with the cars. It is smaller, however, the bore being 4 1-2 inches and the stroke 5 1-2 inches. The cylinders are

cast in pairs, with integral heads and water jackets, an opening at the top through each cylinder head and water jacket being closed by a single plug that screws into the top of the cylinder and has a shoulder which forms a joint in a corresponding recess in the top of the water jacket. Gun iron is used for the castings and each casting is subjected to 500 pounds hydraulic pressure before it is passed. That this test is more than a formality is shown by the fact that in one or two cases cylinders have failed under the test and been rejected.

The pistons are very long, of light construction, and each is stiffened at the closed end by six deep interior ribs. Four packing rings are placed in separate grooves, all near the upper end. An oil groove encircling the piston is cut close to the lower

end. Oil is fed under pressure to this groove through the cylinder wall. The tool steel gudgeon pin, which is hollow, receives oil from the opening in the cylinder wall and carries it to an oil hole communicating with the bearing surface. The small end bearing in the connecting rod is solid, with bronze bushing, and the big end bearing is adjustable, a cap being secured by bolts and castellated nuts. Drop forged steel is used for the connecting rod itself, which is of I section. Bronze, with babbitt lining forms the crankpin and main shaft bearings, the latter being 1 7-8 inches in diameter and nearly 4 inches long. One intermediate bearing is placed between the two pairs of cylinders, and is of the same size as the outer bearings. Crankpin lubrication is effected by means of short tubes, screwed into the bearing caps and bent to point in the direction of rotation, so that they scoop the oil forcibly into the bearings. This system was used in the

motor of the autoboot *Vingt-et-Un*, and gave satisfaction.

The cylinders are finished by a process which closely resembles the conditions of actual use in its smoothing effect on the inner walls, provision being made for perfect accuracy in size and roundness. Pistons and rings are finished in the same manner, the manufacturers preferring this method to the grinding process.

VALVES MECHANICALLY OPERATED.

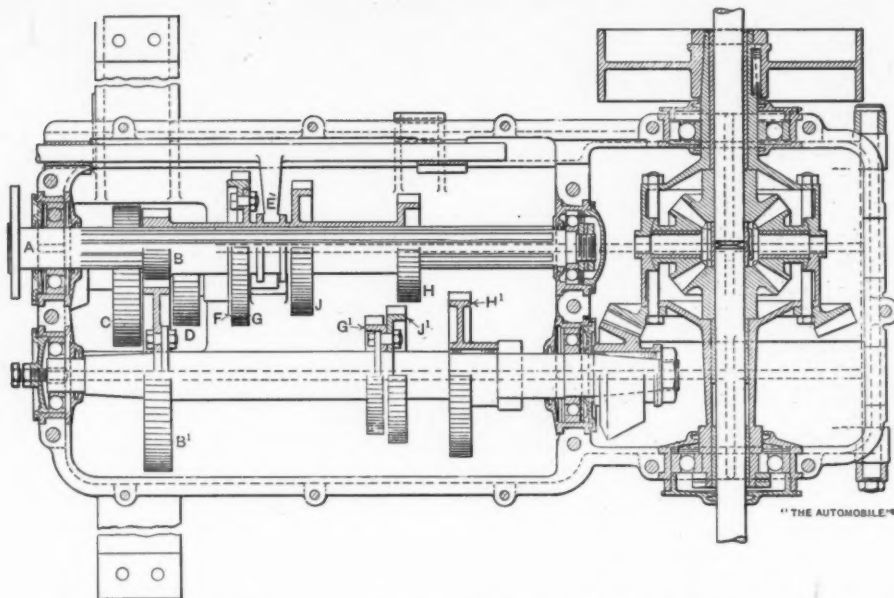
All valves are mechanically operated, a cam-shaft running along each side of the crankcase completely housed. Each cam-shaft, with its cams, is made in a single solid piece of steel hardened and ground, there being no separately attached cams. The push rods are hollow, carrying rollers at the enlarged lower ends, against which the cams bear, and being tapped at the upper ends to take the threaded ends of the valve stems. This allows of adjustment, and lock nuts on the valve stems hold the parts in position. The lower ends of the bronze locknuts are extended downward and counterbored to an easy fit over the push-rod guides. When the valves drop

under the pressure of the springs this arrangement acts as a dash-pot, easing somewhat the impact of the valves against the seats when the motor is running fast. This, in combination with the large fillets of the valves, tends to prevent the breakage of the latter. All the inlet valves are on the right-hand side and the exhaust valves on the left. The valves are seated directly on the cast iron and are removable through the usual openings above them, the covers of which are held down by yokes in the now customary manner.

The carbureter is a modification of the Mercedes type. Lubrication of the motor is by force feed, sight glasses being located on the dashboard.

THE COOLING SYSTEM.

A cellular cooler and tank combined is located as usual and circulation is maintained by a centrifugal pump secured to the crankcase on the left-hand side, where it is driven by gear and shaft from the half-



CHANGE-SPEED AND DIFFERENTIAL GEARING OF SIMPLEX CAR HOUSED IN ONE BOX.

time gears. Fiber and bronze gears, unusually large and with broad teeth, drive the cam shafts. These gears run very silently and their large contact line insures long wear, freedom from accidental breakage and accuracy of timing, even after long use.

The spark plugs are screwed into the sides of the inlet valve chambers, and the distributor, driven by the half-time gears, is located on the right hand side at the front of the motor.

ALUMINUM CLUTCH, LEATHER FACED.

The clutch, of the self-contained pattern is of aluminum, faced with leather, and may be removed by taking out the ring that retains it within the flywheel. It is of large size and great strength, features that are carried out throughout the power transmitting system. An interlock is provided so that application of the brake also throws out the clutch. The flywheel is of gun iron, finished all over, and weighs 100 pounds.

CHANGE SPEED AND DIFFERENTIAL GEARING.

The change speed and differential gears are enclosed in one aluminum case, the differential being on a countershaft, from the ends of which the rear wheels are driven by sprockets and chains, the rear axle being "dead." Four forward speeds and one reverse are given by the change speed gears.

In the accompanying drawing the first or slowest speed gears are engaged, the drive being through shaft *A* and gears *B* and *B'*. To engage the reverse, the gear-shifting fork *E* is moved to the left by means of its sliding shaft, which is moved longitudinally by the operating lever at the driver's seat. Gears *C* and *D* are mounted on a short countershaft below the shaft *A*, and together are movable to the left against a helical spring which tends to keep them out of mesh in their normal

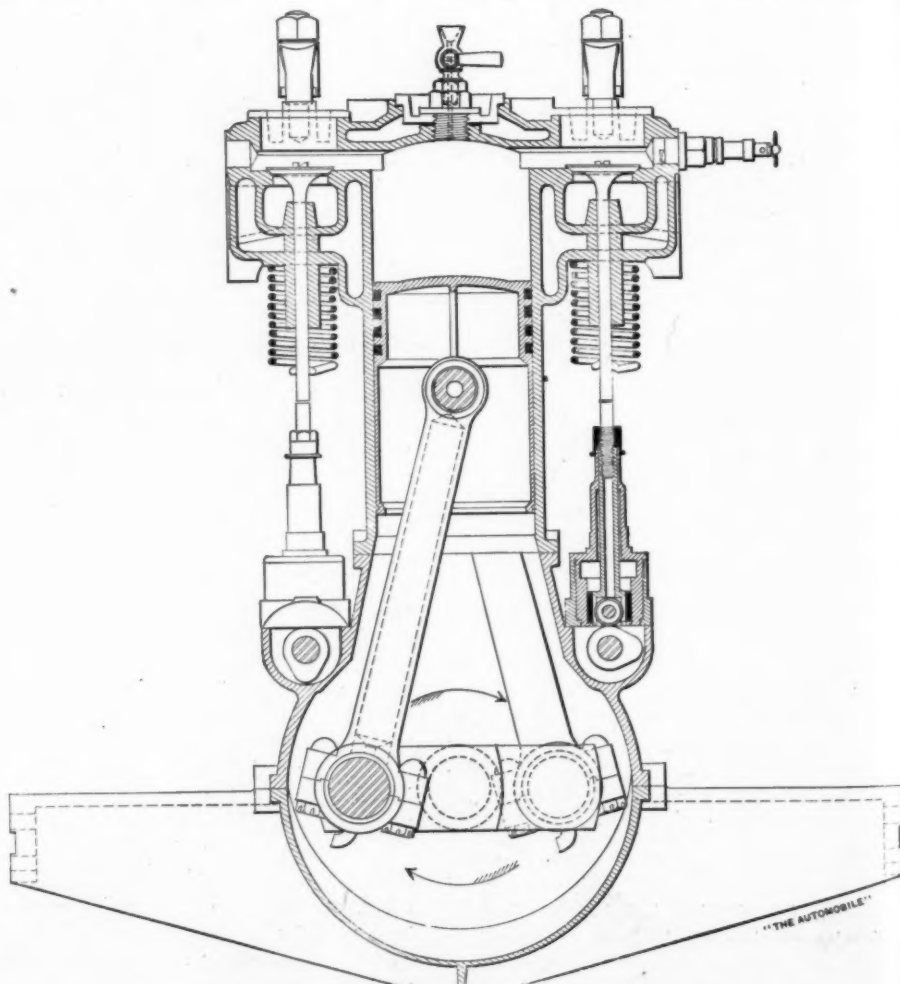
position, as seen in the drawing. When gear *B* meshes with *C*, the countershaft revolves idly until the further movement of the lever brings an annular projecting face *F*, formed on gear *G*, against the side of *D*. This occurs just as *B* frees itself from *B'* and fully meshes with *C*. The gears on the countershaft are now forced

to the left, *C* and *D* maintaining their positions with relation to each other, and *D* meshes with *B'*, which is thus rotated in the reverse direction. When the gears are shifted back to the low-speed position the reverse countershaft with its gears is carried back to normal position by the spring. It will be seen that none of the reversing gears is in mesh when the car is running forward. For the second speed the sliding shaft is shifted to the right until *H* and *H'* mesh, while further movement in the same direction causes the successive meshing of *J* and *J'*, and of *G* and *G'*, the former giving the third and the latter the fourth or highest speed. Ball bearings of what is called the Mercedes type are used throughout the change speed and differential gearing.

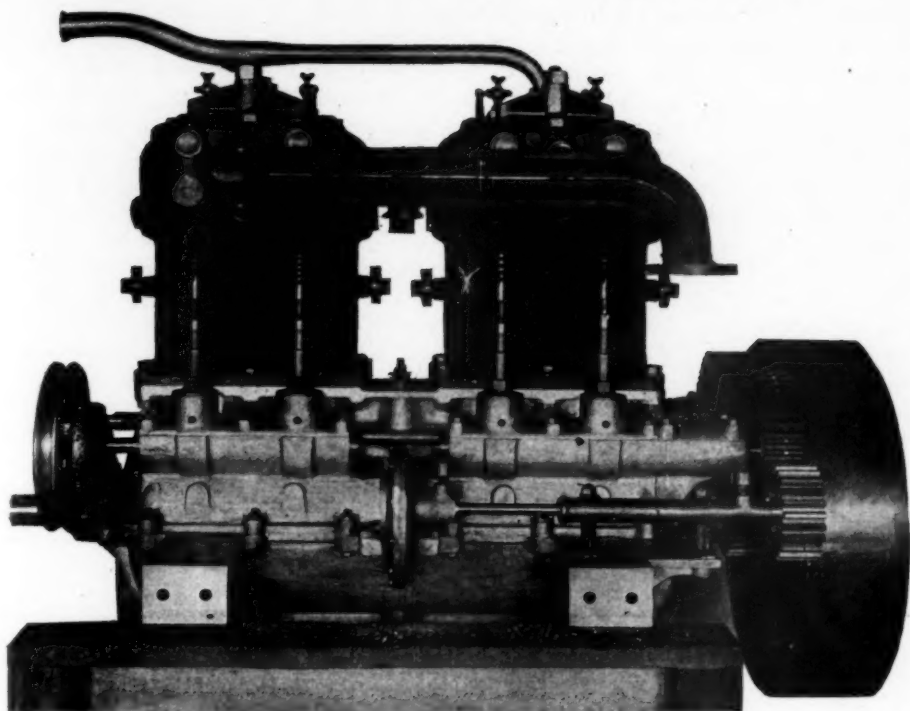
The constructional details and the arrangement of the bevel gear differential are clearly indicated in the drawing. The differential brake drum is carried on the right-hand side, just outside the casing, and is of cast steel.

PRESSED STEEL FRAME.

Following modern practice, the frame is made of pressed steel, cold formed, the greatest dimensions being 4 1-2 inches deep, 1 3-4 inches wide and 3-16 of an inch thickness of metal. The top of the frame is 24 inches from the ground. A narrow front is



VERTICAL TRANSVERSE SECTION OF ONE OF THE CYLINDERS.

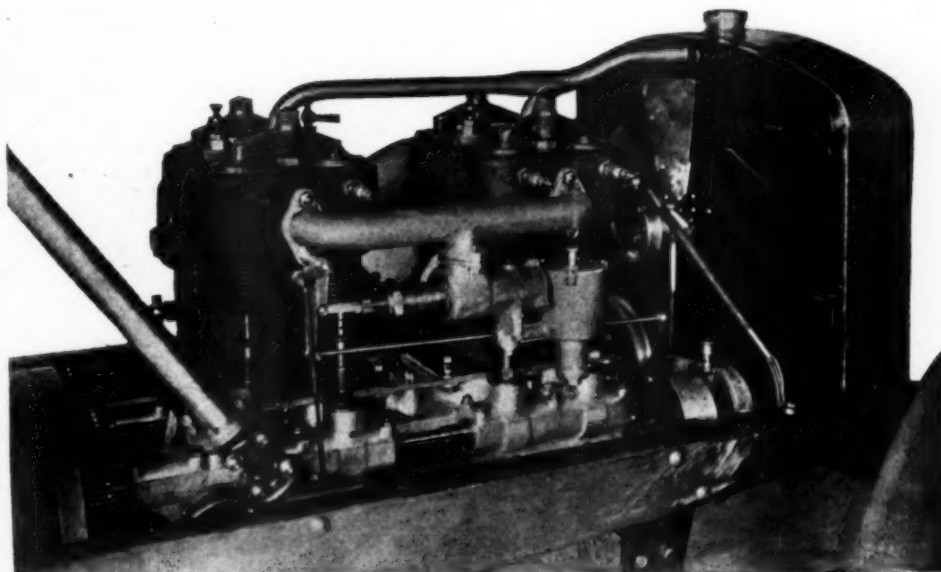


EXHAUST SIDE OF SIMPLEX MOTOR, SHOWING WIDE GEARS AND CIRCULATION PUMP.

secured by offsets just behind the motor space. Heavy cross members of I section support the motor and transmission gear box, but the frame ends are of the same material as the side members, securely braced at the corners. Steel forgings are used for the spring hangers, and are hot riveted to the frame, extending well back.

NOVEL DISTANCE ROD ADJUSTMENT.

Parallelism of the rear axle and the countershaft from which the rear wheels are driven is secured by the use of distance rods. Each rod is of heavy steel of I section, one end being flattened to form the rear axle connection and the other end round in section and hollow, the hole being tapped to receive a short, hollow rod, threaded for its full length outside and smooth inside, and having a hexagon head at one end. This piece screws into the hollow end of the rod and in turn receives the shank of the piece that forms the connection at the countershaft. This connecting piece extends through the hollow in-



INLET SIDE OF ENGINE, SHOWING MERCEDES TYPE CARBURETER AND VALVE CAP YOKES.



ALUMINUM CLUTCH, LONG PISTON AND FOUR-THROW CRANKSHAFT OF SIMPLEX CAR.

intermediate member in which it is an easy fit, and is retained in position by a nut pinned in place. By applying a wrench to the hexagon head of the threaded member, the rod may be adjusted as to its length without disconnecting the joints. A split lug on one side of the hollow end of the main rod, with a clamping bolt, provides a simple and efficient locking arrangement by which the adjustment is held. Steel forgings are used for this rod, which must be able to withstand considerable strain at times.

NEW IDEA IN SPRING SUSPENSION.

Semi-elliptic springs are used fore and aft, and these embody some ideas that do not appear at a casual glance. In order to secure the necessary flexibility without excessive range of movement, the rear springs are made with their rear portions quite short and stiff, while the front portions are considerably longer and more flexible. Under ordinary road conditions the greater part of the work is done by the long, flexible forward parts of the springs, but an unusually severe shock will quickly bring these down to a point where they offer as much resistance as the stiff rear por-

tions. When this happens the rear ends are brought into action and check the deflection before it becomes excessive. The rebound is prevented from being too violent by the fact that the stiff ends of the springs rapidly return to their normal state, while the flexible ends have not sufficient strength to cause a violent reaction.

In practice this system has given excellent satisfaction to the builders, the first severe trial having been given on Frank Croker's Vanderbilt Cup racing car, which was equipped with rear springs made according to this theory. This is now the standard suspension of the Simplex cars. The front springs, however, are of the usual semi-elliptic pattern, both ends being of the same strength.

EXTERNAL BAND BRAKES.

Brakes are all of the exterior band type, the drums being of cast steel and the bands of copper. The bands are made in halves, hinged at one side and provided with a powerful toggle joint at the other, to which the operating lever is connected by a steel cable. A spring acting on the toggle lever causes the brake to release when the operating lever is placed in the off position. Limit stops placed on each side prevent excessive movement of one-half of the band and insufficient movement of the other, with consequent dragging. Water, oil and dirt are stated to be equally incapable of impairing the action of this brake. The same arrangement, with slight modification in detail, is used for the differential brake on the countershaft. The drums are large and heavy, providing ample braking surface.

STEERING AND CONTROL MECHANISM.

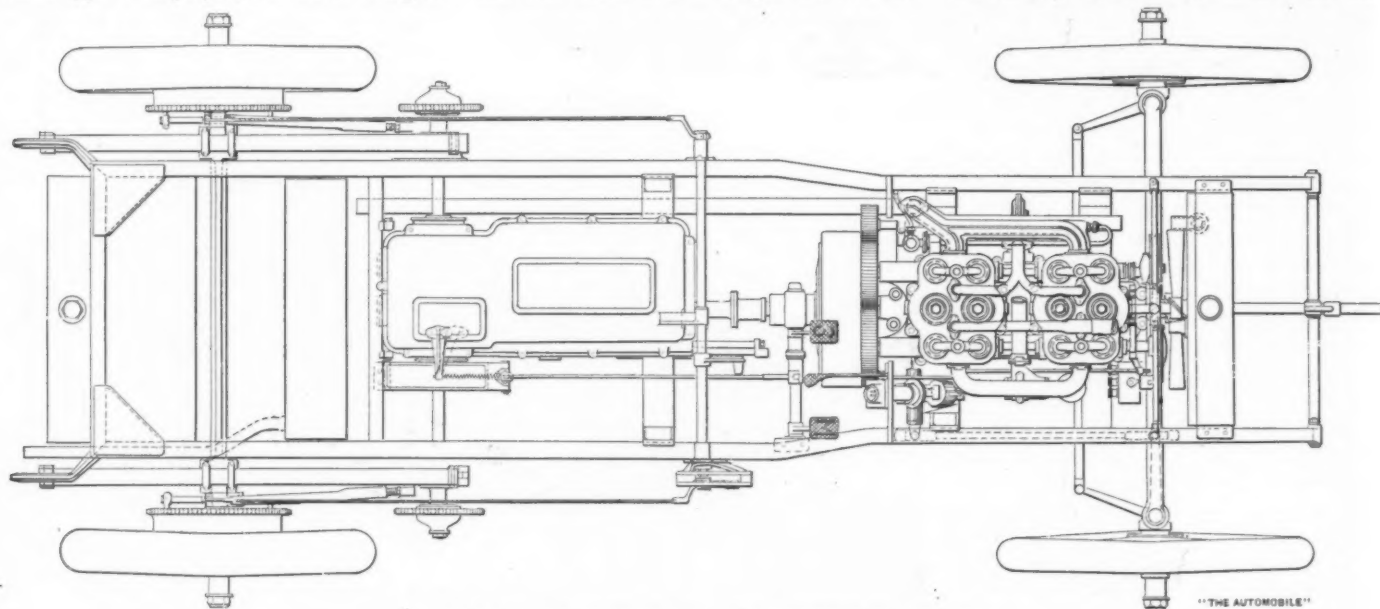
Worm and sector steering gear of the usual type is employed, the worm being of

steel are used. The lower end of the pivot has a long bearing in a socket in the knuckle, while the upper end turns in a ball bearing, which serves to keep the pivot in line and prevents binding. The body of the pivot is bored out from top downward, and the hollow space is used as an oil reservoir, a hole leading from the bottom of the space communicating with a spiral groove cut on the surface of the lower bearing of the pivot. A steel cap covers the top of the hollow in the pivot, and a small oil-hole in the center of the cap is closed by a screw plug. The arms on the knuckles and the connecting rods of the steering gear are steel forgings, the joints being ball-and-socket.

Hickory wheels of artillery pattern are mounted on plain bronze bushed bearings. Rims and tires are imported, the latter being Michelin, 920 by 120 millimeters rear and 910 by 90 millimeters front. Front and rear axles are of forged steel of oc-

mixture may be employed as gasoline at 0.670 sp. gr. (79 degrees Beaume) and of 0.730 sp. gr. (61.7 degrees Beaume) in order to obtain a density from 0.680 to 0.685 sp. gr., but such a product is not satisfactory, for the heavier gasoline is not volatile enough to burn quite freely in the combustion chamber of the motor. A heavy petroleum requires more air than a light petroleum, consequently, if the carbureter is adjusted for a light product it will not be properly suited to a heavy oil in which there is generally a certain residual which will not be consumed, and a scale will be formed which will clog the motor.

Certain automobiles of the heavy type consume paraffine or petroleum oils. The advantage of this employment rests especially on the fact that such products are obtained more readily than gasoline, and that there is more security in their use. Gasoline is very inflammable, and its vapor is exceedingly liable to explosion, much more



PLAN DRAWING OF SIMPLEX 30-H.P. TOURING CAR CHASSIS.

steel and the sector of bronze. The steering wheel is of wood and aluminum construction, and is keyed to the column with a steel key. Throttle and ignition levers are placed on top of the steering wheel, convenient to the fingers. Each lever connects with a quick-threaded screw and nut arrangement within the column, by means of which two steel rods, one operating the throttle in the carbureter and the other the ignition timer, are drawn up. As any force tending to push the rods downward would have the tendency to bend them, springs are provided on the bell-cranks, through which motion is transmitted, to produce the return movement when the levers are moved in the opposite direction. Thus the rods are subjected to tension only. The usual pedal accelerator works on the throttle.

STEERING KNUCKLE OILING SYSTEM.

Substantial steering knuckles of forged

tagonal section, and are heavy and substantial. The muffler is of steel, large size, and is located just back of the gear box, extending across the frame. The bonnet is of aluminum. Gasoline is carried in a heavy copper tank of twenty-four gallons capacity, hung at the extreme rear end of the frame.

Velvet bronze, the composition used for bearings in this car, is an alloy selected by the Pennsylvania Railroad for bearing metal after something like 1,000 tests of various compositions had been made. Every nut on the car is castellated or pinned.

A Note on Gasoline.

A recent study on the qualities which gasoline ought to possess for advantageous employment in automobiles has reached the following results. It should be very limpid, possessing a density of 0.680 to 0.690 specific gravity, and perfect homogeneity. A

so than that of petroleum oils. The flashing point of American oils varies from 73 degrees to 110 degrees F.; the flashing point of Russian oils, from 80 to 100 degrees F. Scotch oils vary from 105 to 120 degrees. It should not be forgotten that a motor employing oils having a low flashing point will work better than one employing Scotch oils, for instance. This quality must be kept in view in the use of petroleum oils in motors. —*Le Journal du Pétrole*.

A Matter of Association.

Last year she simply would not wear

A glove from soil made clean;
Cleaned gloves, she said, disgusting were,
They smelled of gasoline.

This year a man who's wooing her,
He rides her miles and miles

In his new gasoline machine,
And she just smiles and smiles.

—*Washington Post*.

The Claudel Kerosene Carbureter.

Designer's Theory of the Gasification of Heavy Oils, and Its Practical Application to Automobile Motors.

A LONG study of the difficult but very important problem of substituting kerosene and other heavy oils for gasoline in explosion motors has been made by H. Claudel, of France, who has invented a special carbureter to utilize kerosene oil that is attracting much favorable notice in Europe. In a recent issue of *La France Automobile*, Maurice Chérie gives a clear and full description of this new device and also of the inventor's theory of combustion in the gas engine, which is hardly less interesting than the carbureter. Following is a translation of the article.

In order that the oil shall produce its maximum thermic effect, resulting in a complete combustion at the highest possible temperature, it is necessary that at the instant of ignition its constituent elements shall be dissociated, brought to gaseous state, and brought into intimate contact with some exact quantity of air. The broad principles of the operation are fixed, but it still remains to discover the exact laws of this vaporization, which, in certain cases, remains incomplete and falls short of an absolute gasification.

VAPOR VERSUS GAS.

These two terms, vaporization and gasification, are not really synonymous, the difference between them being described by Mr. Claudel as follows:

Vaporization, in bringing to an atomic state the combustible particles, increases considerably their volume compared with that in a gaseous state; it also limits the combustion to the outer surface of each globule, and does not permit of the combustion of the central kernel, except to a limited degree and slowly under the action of certain elements in excess, the useless products from these resulting in a loss of heat.

Combustion from the atomic state shows two successive stages, the first being the combustion of the outer envelope, which leaves a mass of inert products isolating the central kernel. This kernel can be ignited only after the envelope of inert gases has been dispersed by the explosive wave or enriched by a waste of some valuable element. The kernel when superheated by this combustion of its surface is partially disrupted, and—in the case of a heavy oil—forms a deposit on the parts of the motor, enveloping them with a refractory substance which resents all attempts at lubrication.

To this imperfect combustion are due the fumes and acrid odors of the exhaust from kerosene motors, and also the necessity for frequent taking apart and cleaning, which make the heavy-oil motors so unsuitable for the continued service demanded in the automobile and the launch.

It is also true that the use of gasoline under such unscientific conditions is accompanied by fewer drawbacks than attend any other form of liquid fuel. The slight cohesion of its constituent molecules, due to its extreme volatility, facilitates their intimate mixture with other elements, and permits the convenient use of gasoline in the most perfect form of heat engine—the explosion motor, so highly rated for its absolute regularity, its power, and its economy. The physical qualities of gasoline are such that its vapor closely approaches a true gas; this characteristic especially adapting it for use in automobiles.

CHEMISTRY OF THE OPERATION.

The Claudel carbureter is designed especially for the complete disruption of heavy oils in accordance with the foregoing theory, the details being thus stated: If the vapor of water (H_2O) be mixed in a superheated tube or retort with the vapor of kerosene, and the molecules of oil be brought to the point of disruption, above 850 degrees, there results a transformation into oxygen and hydrogen; the oxygen in a nascent state, with the carbon, combines to form carbonic oxide, volatile and inflammable, and mixes freely with the other explosive gases and the free hydrogen, itself a highly inflammable gas. There results from this combination a reclamation of lost heat and a destruction of all the solid products of combustion.

If, on the other hand, in place of the vapor of water, one should introduce carbonic acid (CO_2) under the same conditions, the result will be a separation into carbonic oxide and oxygen ($CO + O$). The oxygen will transform the carbon into carbonic oxide before the production of coke; and this phenomenon, which will occur only in contact with the most highly heated parts of the retort, will induce a partial regeneration of the combustible elements at the same time that it will leave at liberty the inert gases, assuring the disruption of the remaining elements.

These two reactions may be produced separately or together; but where can one find the vapor of water and the carbonic acid? Most fortunately, the motor itself assumes the task of providing the oxidizing elements for its fuel, the exhaust gases from an explosion motor being composed, in effect, of the vapor of water, carbonic acid and nitrogen. The first two elements play their part in the oxidation of the carbon, and the third—nitrogen—far from being an obstacle, contributes its part to aid the disruption. It is necessary only to introduce in correct proportion and under proper means of regulation the exhaust from the motor into the retort of a carbureter to ensure complete gasification,

and with entire freedom from deposits of waste.

UTILIZATION OF THE HOT EXHAUST.

But, to avoid this phenomenon of carbonization, which would result if the fuel were projected in a liquid state on the walls of the retort, the oil is first brought to a state of superheated vapor; and, owing to its high temperature, the exhaust from the motor offers a convenient means to this end. In order to be assured of a perfect disruption of the oil particles, this part of the work has been made completely independent of the aspiration of the motor, and it is prolonged for the full duration of the cycle by the slow and evenly regulated introduction of the oil in a fixed quantity. The duration of this period of introduction is consequently four or five times longer than in the case of simple aspiration through a vaporizer.

By this sequence of several simple and elementary processes, a perfect gasification of heavy oils may be assured, with a maximum of thermic efficiency, and also a partial recovery of heat elements usually wasted; at the same time there is a total absence of a deposit of solid residuum encumbering the internal parts and interfering with the lubrication. It is, however, necessary to reduce the excessive temperature of the exhaust, which may attain a point harmful to the best operation of the motor; and to this end Mr. Claudel has introduced, as the oxidizing element, atmospheric air, composed of oxygen and nitrogen. The combustible mixture thus obtained includes a certain quantity of petroleum vapor, which is accelerated in its passage by the particles of fixed gas, the result being a combustion which is practically perfect.

MEANS OF AUTOMATIC REGULATION.

In the practical application of this theory the important point is the regulation of the various elements, which Mr. Claudel has endeavored to simplify and to make automatic. In his apparatus the aspiration of the motor produces an automatic introduction of the liquid fuel and of the air necessary to the oxidation of the coke, the air and the liquid being brought into contact in the interior of the retort, which is heated externally by the exhaust from the motor. The product of the resulting disruption of the oil is drawn by the aspiration from the retort to a mixing chamber, where it meets an additional supply of air drawn in after the usual manner by the aspiration of the motor.

The route which the liquid, in its transformation first to a vapor and then to a gas, is obliged to follow in contact with the proper quantity of air, makes certain the transformation of the coke into oxide of carbon, thanks to the oxidation produced by the air, which gives up almost all of its oxygen. The quantity of air supplied to the retort is proportioned to the amount of coke produced by the oil; and it is always very small in proportion to the amount of air re-

quired to perfect the final mixture. The passages from the retort to the mixing chamber, as well as the disrupting tubes arranged in the interior of the retort, are designed to produce such a resistance as may best facilitate the complete union of the elements in the mixing chamber. This resistance increases with the speed of the flow, that is to say, with the suction of the motor in the mixing chamber; it results, consequently, that when the speed of flow increases, the pressure in the retort decreases—and consequently the flow from the oil-supply orifice also increases, but in a lesser ratio than if the oil orifice were in direct communication with the mixing chamber or the main body of aspirated air. The various obstructions necessary to the disrupting and mixing operations are so arranged that the carburation is constant at the maximum, minimum, and all intervening speeds. With no movable part or regulator whatever, there is still a most perfect control of the carburation.

CONSTRUCTION OF THE CARBURETER.

Referring now to the apparatus itself and its mode of operation, the carbureter is composed of a double heating chamber *u*, in the center of which is placed the retort *m*. In the annular space included between the retort and the outer walls of the heating chamber, the exhaust from the motor circulates, entering by the pipe *k* and escaping by the pipe *l*. The position of the retort *m* is asymmetric with regard to the center of the heating chamber, in proportion to the supply and exhaust pipes, *k* and *c*; so that the amount of heat imparted to the retort may be regulated by the movement of the valve *i*, in Fig. 3.

With the valve *i* in the position shown, the flow of heated gases from the exhaust follows the course of the arrow *z*, being in contact with only a small portion of the circumference of the retort, and imparting but little heat. With the valve in the position *i'*, shown by the dotted lines, the current of gas, following the direction of

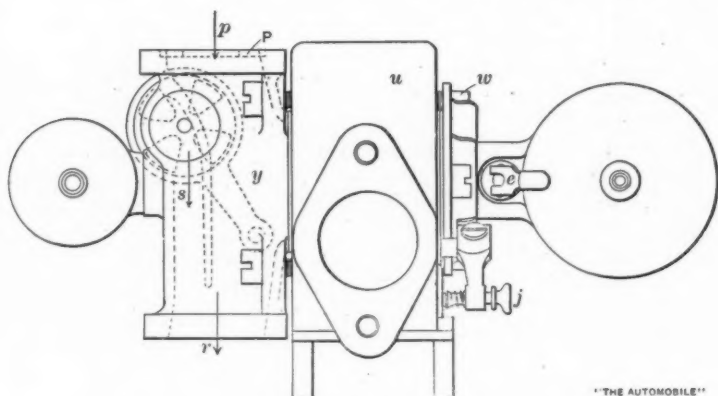


FIG. 1.—PLAN AND TOP VIEW OF CARBURETER.
Dotted Lines Show Auxiliary Air Intake.

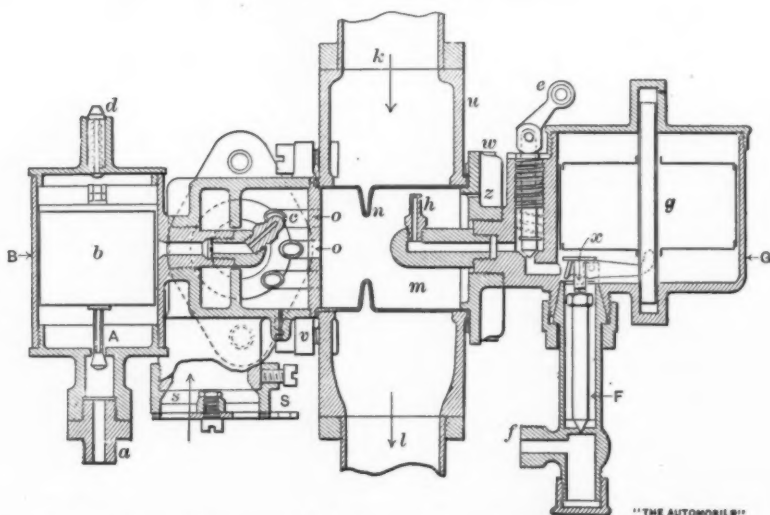


FIG. 2.—VERTICAL SECTION OF CLUADEL CARBURETER FOR HEAVY OILS.

A, Regulator for gasoline supply. B, Gasoline reservoir. F, Stop valve for oil supply. G, Oil reservoir. P, Damper of main air supply. S, Damper of auxiliary air supply. T, Locking lever of air damper of exhaust. a, Gasoline supply. b, Gasoline float. c, Gasoline feed nipple. d, Button for lowering float. e, Independent oil supply valve. f, Oil supply pipe. g, Oil float. h, Oil-feed nipple. i, Exhaust pipe valve. j, Stop and lever of exhaust pipe valve. k, Supply pipe from exhaust to carbureter. l, Discharge pipe of exhaust. m, Retort. n, Rib of retort. o, o, o, Mixing pipes from retort. p, Main air supply. r, Pipe from carbureter to motor. s, Auxiliary air supply. u, Heating chamber for retort. v, Drain. x, Adjusting screw of oil supply valve. y, Mixing chamber. z, Air duct to retort.

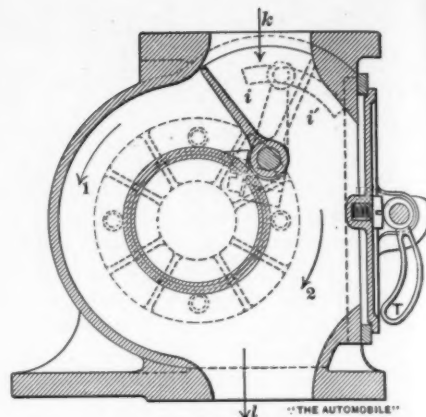


FIG. 3.—TRANSVERSE VERTICAL SECTION
THROUGH RETORT AND EXHAUST PIPE.

arrow *i*, almost completely surrounds the retort.

The difference between the two passages is further increased by a very thin wall on the right of arrow *z*, which may be in the form of a screen or damper permitting an ingress of outside air; while the wall on the left of arrow *i* is a part of the casting of considerable thickness, thus retarding the radiation. The valve *i* is operated by the lever and spring stop *j*, Fig. 1, while the cam lever *T*, Fig. 3, regulates and locks the cooling damper. By the proper adjustment of these two valves, and the diversion of the exhaust, the retort may be maintained at any desired temperature up to the maximum limit of the exhaust.

RETORT AND MIXING CHAMBER.

The retort is made of drawn tubing, which may be formed with an internal web *n*, increasing the heating surface and breaking the flow of the combustible contents. The retort is connected with the mixing chamber *y* by the tubes *o, o, o*, of such size and form as to act in connection with the web *n* to break up the various elements within the retort and to provide the throttling which is essential to automatic regulation.

The mixing chamber is provided with three openings; one for the main air supply, *p*; one for an auxiliary air supply, *s*; and one, *r*, for the passage of the mixture to the motor. An internal diaphragm directs the course of the air admitted by *p* and *s*, and regulates the suction according to the speed and other conditions. The opening *s* is fitted with a damper by which the auxiliary supply may be regulated according to the kind of oil used.

Attached to the mixing chamber is the float chamber *B* of the ordinary gasoline carbureter, with the float *b*, regulating the level of the gasoline which enters by the tube *a*, and which is discharged into the air of the mixing chamber by the nipple *c*, on first starting the motor.

The regulation of the heavy oil supply is through the float chamber *G*, and float *g*, the oil entering at *f*, under the control of the point *F*. The float *g* operates a lever, shown in Fig. 2, which acts on the upper end of the pointed rod *F*, the exact ad-

justment being made through the screw *x* and its nut. Between the discharge nipple *h*, within the retort, and the float chamber *G* is a spring valve operated by the lever *e*, Figs. 1 and 2, by which the passage of the oil may be controlled.

A very important detail of the retort is the plate *w*, which connects it with the oil float chamber, and which is pierced, as shown in Fig. 2, by a small opening *z*, which admits the necessary amount of free air in proximity to the nipple *h*.

METHODS OF STARTING.

In practical operation, the motor may be started by means of the auxiliary gasoline carbureter on the left, with a small reservoir for fuel, and when well under way and with the exhaust going, the gasoline may be shut off and the kerosene turned on. The motor may, however, be started directly on the oil, provided a torch is first used to heat the retort until a flow is secured from the exhaust.

The oil supply in the reservoir *G* is maintained at a constant level by means of the float *g* and its lever acting on the valve *F*; the rate of feed through the nipple *h* is regulated by the amount of pressure within the retort *m*, which is in turn dependent upon the flow of the gases through the contracted opening of the rib *n* and the indirect passages of the mixing tubes *o*, *o*, *o*, which serve to alter the effect of the motor's aspiration and to make it prolonged and regular instead of intermittent. At the lower speeds there is very little resistance to the flow from the retort to the mixing chamber; but, as the speed increases and the aspirations of the motor become more powerful, the effect is to throttle the gas in its way through the indirect passages. The result of this apparently contradictory phenomenon is an automatic regulation which is practically perfect. Once set for a given quality of oil, the supplementary air supply *s*, *s*, may be left without further attention; the air duct *z* of the retort remains unchanged; and the position of the regulating valve *i* in the exhaust pipe as set by the lever and stop *j* is also unchanged. It has been found in practice that the exhaust supply pipe *k* should be placed as close as possible to the heads of the cylinders.

AUTO BOAT CARNIVAL IN FLORIDA.

The Palm Beach Power Boat Association will hold its first annual auto boat and water carnival on Lake Worth, Palm Beach, Florida, on February 1, 2 and 3. W. J. Morgan, representing the association, has asked for entries and suggestions regarding the program of races, which has not yet been made up. It is proposed to hold four races each day. Arrangements for the transportation and care of boats will be made by the association, so that those who enter their craft will be relieved of this trouble. The president of the association is H. M. Flagler; vice-president, W. C. Allison; secretary and treasurer, Fred Sterry.

The Chrono-Velocimeter.

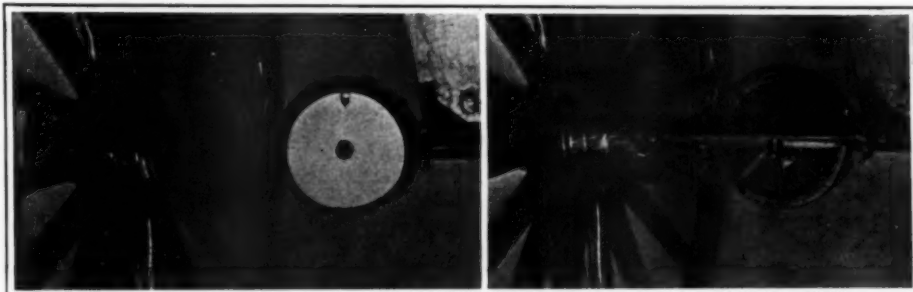
There is soon to be placed on the market by a Philadelphia concern a little instrument under the above name adapted to be fitted to both pleasure and commercial automobiles. As the name implies, the instrument measures both time and speed, and in effect is a combination of chronometer, speed recorder, and odometer. It furnishes to the owner of the car, the manager of a garage that rents automobiles, or to the manager of the delivery department of a large store a complete record of the daily performance of any vehicle to which it is attached. It furnishes a permanent record of the hour and minute at which a car leaves the garage or stable, of the miles traveled during the day, of the speed at which each mile was covered, and of the number and duration of all stops made.

The immense utility of such an instrument is apparent, as it provides the best possible check on the employe in charge of the pleasure car or the delivery wagon.

Chrono-Velocimeter that is made for horse-drawn wagons, and which has been in use by several of the large brewing companies in New York for nearly a year. The style to be brought out for automobile use will have the recording portion of the instrument adapted to be attached to the dash, the needle being worked by impulses transmitted by a flexible shaft from the piston on the axle. The case will be of suitable light metal and of a size that will not detract from the appearance of the car.

The case of the instrument is provided with a lock, the key to which is intended to be carried by the owner of the car, the manager of the garage or delivery department, or by the company furnishing the instruments. The device will record every movement of the car for a period of twenty-four hours, as at the end of one complete revolution of the dial the perforator automatically moves toward the center and begins a new circle of perforations.

When the case is opened and the dial removed, the number of punctures made dur-



THE CHRONO-VELOCIMETER ATTACHED TO WAGON AXLE—CLOSED AND OPEN.

A general adoption of it should go a long way toward discouraging the too common practice of unscrupulous chauffeurs who go out for night drives in their employers' cars without the owners' knowledge and frequently figure in the police and criminal courts afterward.

The Chrono-Velocimeter consists of a clockwork apparatus enclosed in a dust- and water-proof metal case of circular form. Within the case is a circular sheet of paper having 144 radial markings at the edge. Every twelfth line is printed very heavy and is numbered for the hour of the day, there being twelve such marks. Every third one of the eleven intermediate marks is printed heavier than the others, but lighter than the hour lines, and is numbered for the quarter hour. The lightest marks indicate five-minute intervals during the twelve hours. This sheet of paper is rotated by the clockwork under the point of a needle, which perforates the paper at the end of each quarter mile, half mile or mile traversed, as preferred. The paper disc makes one complete revolution every twelve hours. The needle is actuated by means of a piston fixed on the axle of the car, which has a roller at its outer end bearing against a cam plate or ring attached to the hub of the wheel, as shown in the accompanying illustrations.

The engravings show a form of the

ing any given interval as indicated by the printed lines indicates the distance traversed in that time. If the car is standing still there will be no perforations, or if it has been run at high speed the perforations will be close together. Thus it not only informs the owner if the car has been used without his authority, but if desired, can be used as evidence in a court to refute the charge of excessive speeding.

In a large renting business or delivery system, it saves much clerical work, obviates the need of "spotters" and provides the management with a complete record of the work done by the wagon and its driver.

A. C. A. DECIDES TO BUILD.

At a meeting of the Board of Governors of the Automobile Club of America, held in New York on December 7, the club house committee formally reported in favor of building a clubhouse and garage, and suggested two locations, one on either side of Central Park. President Morris, who was in the chair, was empowered to appoint a committee of three to choose a site and plans, subject to satisfactory financial arrangements. A subscription form will be issued to club members.

A reward of \$100 was offered for information leading to the arrest and conviction of the persons in an automobile who ran down Jacob Clemons, on November 17.

Suggestions to the Inexperienced.—XI.*

Systems of Side-Chain Drive from Counter-Shaft and Drive by Propeller Shaft to Live Axle Made Plain.

By A. D. RIVER.

A LIVE axle which drives the wheels by its own rotation must necessarily be made much more substantial than a "dead" axle, on whose ends the wheels turn freely under the influence of an external driving force. The "dead" axle is also cheaper, both to make and to repair, since it can frequently be welded if broken, whereas any break in the "live" axle necessitates replacement. Partly for these reasons, and partly because, in a car of very high power, the engine is usually placed in front, the "two-chain drive" is nearly universal with cars of over, say, 30-horsepower, though there are some notable exceptions.

A four-cylinder vertical motor, if of more than 10 or 15 horsepower, is almost neces-

The chief drawback to the side-chain drive is the necessity of keeping the chains—which, being close to the wheels, are much exposed to the dust picked up by the latter—clean and well lubricated. Owing to lack of room, it is nearly impossible to encase them, and the only thing to do is to give them regular attention. It is said by some drivers that the side-chain car is more liable to skid than the live axle car, but this cannot be considered proven, as other conditions affecting skidding, such as weight and its distribution, may vary considerably with different cars.

The inconvenience of cleaning and adjusting chains, as well as the occasional breakage from which no sprocket chain seems

It will be noted that the casing which surrounds the bevel gears in Figs. 2, 3 and 4, is of itself of such a form as to lend much stiffness to the axle. It is customarily made of cast steel, and generally ribbed at each end, where the fixed sleeves of the axle are brazed into it. The conventional practice is to key the wheels to the shafts, whereas some makers extend the sleeve of the axle into the hub to carry the load and drive from the outside of the hub by a loose connection with the live axle, as in Fig. 4, issue of November 12.

On account of the unavoidable dead weight of the bevel gears and case, and the heavy construction of the axle generally, the shaft drive, like the single-chain drive, is seldom found in cars of over 30 horsepower, except racers, where the time saved from possible breakages is considered more important than the added wear and tear on the tires.

For light cars, where cost is not the first consideration, the shaft drive is exceedingly satisfactory, as there is nothing about

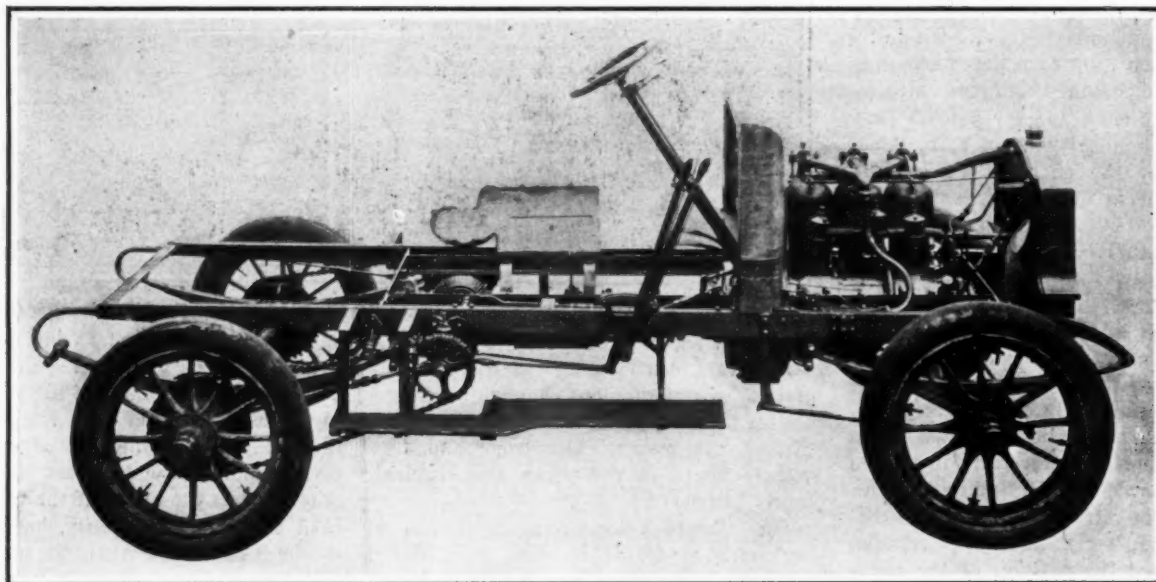


FIG. 1.—STANDARD TYPE OF CAR (THOMAS) WITH SIDE-CHAIN DRIVE FROM COUNTERSHAFT.

sarily placed in front, with its shaft fore-and-aft; hence the speed-changing gears must be located behind it. A pair of bevel gears then becomes necessary to change the direction of motion, and the standard type of side-chain car results, as seen in Fig. 1.

From almost every point of view this arrangement is as nearly ideal as is possible when so many conflicting requirements must be met. The rear axle has little to do, save support the dead weight of the car; the transverse countershaft, as the shaft carrying the sprocket pinions is termed, may be made lighter than a live axle could be, in proportion as it turns faster and against a smaller resistance; and the pull of the chains is applied to the wheel spokes, the sprocket wheels being bolted to these, so that the severe strains in the hubs of the live axle car are avoided.

to be exempt, are avoided by the "propeller shaft" drive, in which the live axle is once more used, but is driven by bevel gears, encased in the axle itself and connected to the final gear drive by shaft with a universal joint near each end. An example of this is shown in Fig. 3, which shows the two-part case forming the centre of the Peerless car axle, with the bevel gears inside and a portion of one universal joint. The bevel pinion shaft runs in two ball bearings, one in front of and the other behind the pinion, and ball bearings are provided also on each side of the differential box, under caps *G G*. These bearings sustain the thrust of the bevel gears also.

In the Pierce Arrow car the rear end of the propeller shaft is squared and fits loosely in the corresponding universal joint in front of the differential, so that it can slide in and out to accommodate the spring play.

it to require attention on the road, and little beyond occasional filling of the case with oil or grease, and renewal or readjustment of the gears when worn, is called for at any time. It is impossible to change the ratio of gearing, as can readily be done in a chain-driven car.

It is held by some drivers that the shaft drive can turn corners more easily than the chain drive at anything above the lowest speeds. A probable explanation of this is that the chains of the latter system have a tendency to ride over the sprockets and cause great friction, due to the effect of centrifugal force on the loose chain, when turning.

For a car of moderate power the problem of cost has been solved very neatly in the Packard *voiture légère* by combining the bevel gear and change gear cases in a single structure, as is shown in Figs. 4 and 5.

*Continued from page 552, Issue of November 12.

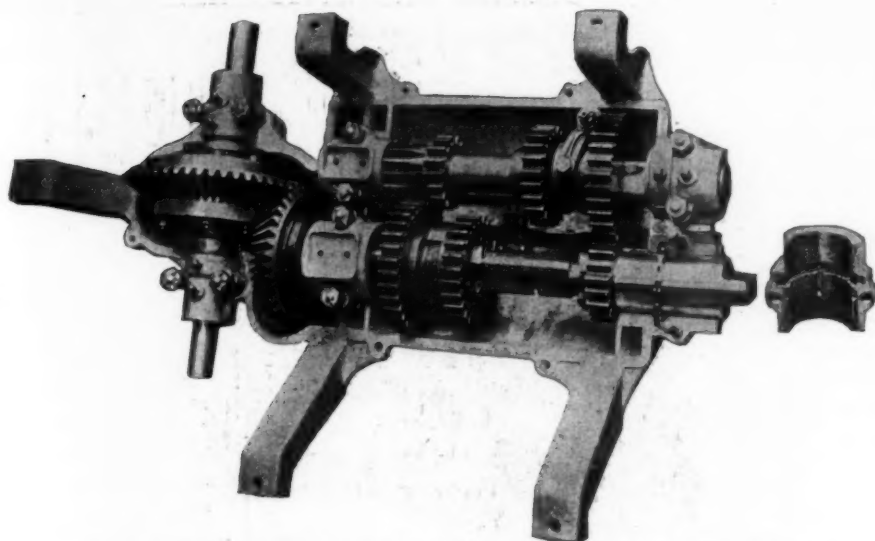


FIG. 2.—CHANGE-SPEED GEARING AND BEVEL DRIVE TO COUNTERSHAFT.

A light but strongly ribbed aluminum case encloses both sets of gears, and the propeller shaft, since it is never geared down to a speed slower than that of the engine, can likewise be very light. To prevent the front end of the gear case from rising, owing to the effort of the bevel pinion to climb up on the bevel gear, a steadying rod is fixed to it, whose front end is pivoted, with a spring cushion above and below, to a cross member of the frame under the footboard. This system is only practicable where, by using moderate powers and the highest grade of workmanship and material, the allowable limits of dead weight on the tires

are not exceeded; but within these limits it is certainly a very happy solution of the problem of putting a high-class car within reach of the man with not too plethoric a purse.

Besides the systems already described, which may be called the standard types of transmission, there are various special types. Thus, the motor of a runabout may be placed in front, with its shaft lying crosswise of the car, and a single chain may drive from a sliding gear or planetary device close to the engine. This is shown in the engraving of the Franklin car, Fig. 6.

Or the motor may be placed in this position, with a chain—usually a Renold "Silent" chain—transmitting from the motor to the speed-changing gears beneath the body; from these one chain or two side chains may complete the transmission.

Several runabouts are built with front motor, shaft drive, and planetary speed-changing gears. The objection to this is that the motors run at fairly high speed, and the planetary gear, which is driven at the motor speed, has a good deal of friction, and therefore at high speed absorbs a good deal of power.

There are two or three friction-driven cars on the market which seem to give fair results, but too little information regarding their performance is available to render it safe to express an opinion as to their future.

The main frame of an automobile may be made of structural steel—channel or angle sections—of wood

stiffened by steel plates or angles, of steel tubing brazed together, or of sheet steel formed into channel or other sections in a powerful press.

Steel tubing, though still employed by some good concerns abroad—notably by Renault—for light cars, has nearly dropped out of use. It is rather expensive, joints made by brazing it are somewhat uncertain, and its rigidity renders it hardly suitable for an automobile frame, in which a certain degree of flexibility is desirable.

Structural steel, especially angle steel, is much used in small and low-priced machines, because it is cheap to get and easy to work. It does not, however, admit of very light construction, though it can be improved in this respect by cutting away the unnecessary metal, as at the ends of a side member.

"Armored wood" is a very excellent material for frames, combining stiffness and toughness in high degree. The usual construction is to rivet a thin steel plate, deepest in the middle and tapering toward both ends, to the inner face of each side member. This gives a good surface for the attachment of cross members, brackets, and the like, and the steel and wood supplement each other's qualities.

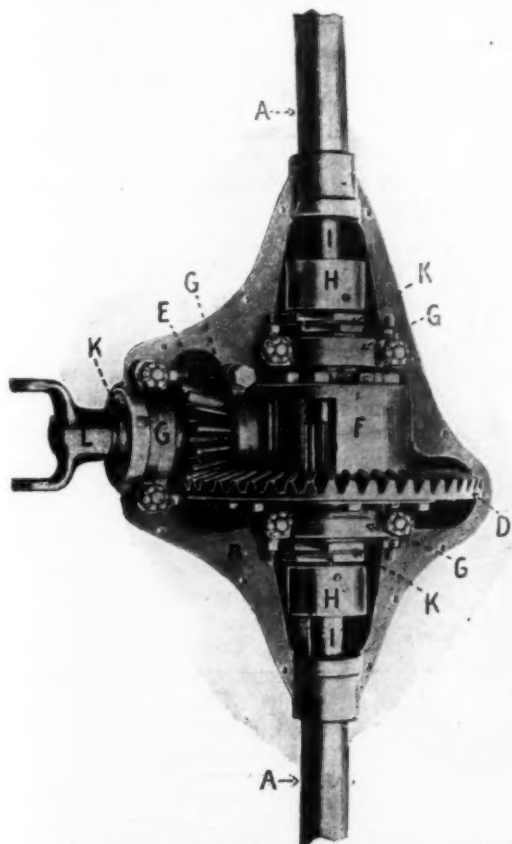


FIG. 3.—ENCASED PEERLESS DIFFERENTIAL AND BEVEL DRIVING GEARS.

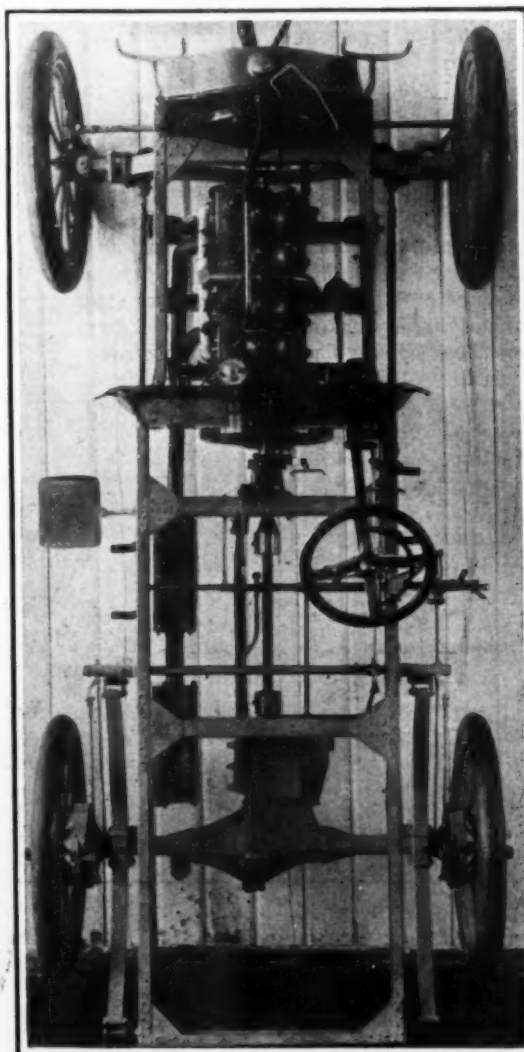


FIG. 4.—TOP VIEW OF PACKARD CHASSIS SHOWING COMBINED TRANSMISSION CASES.

Pressed steel, the latest material for frames, has sprung into great popularity at home and abroad in the past two years. It is expensive, unless large numbers of machines are to be built to a single pattern, since no two patterns of cars are likely to require exactly the same frame, and the dies for pressing the frames are costly. The side and cross members, and the false frame members, if any, are pressed separately and afterwards riveted together. This type of frame can be made very light, since the metal is very effectively placed, and quite thin material—often 1-8 inch—can be used. Consequently it is used in nearly all racers. An example of this class of frame is seen 123456123456 in Fig. 1.

The remark, that a certain degree of flexibility is desirable in an automobile frame, might have been extended. As a matter of fact, even if a rigid frame were desirable, it would be impossible to produce. The road shocks that any machine gets will twist the frame more or less, and the only effect of trying—within any permissible limit of weight—to make it rigid will be to localize these shocks and produce strains and crystallization, which are readily avoided by so constructing the frame that the point subjected to shock will yield somewhat and transmit a portion of the stress to other portions of the frame.

This condition, however, introduces a factor seldom encountered in other classes of machinery. It is impossible, theoretically, and nearly so practically, to "line up" one part, as the motor, with another part, as the gear box, the two parts being supported on different portions of the frame, and run a rigid shaft in bearings through both of these parts. The bearings will not stay in line, and when racked by road travel they will bind on the shaft and absorb power. For this reason it is found necessary, in a case such as that just cited, to use two

shafts, and couple them end to end with a little play in the coupling. This principle applies to all connections between a motor and its gear box, save in the special case, where a single casting serves as base for both, and between the central portion of a cross countershaft and the ends carrying the sprocket pinions. With few exceptions, loose couplings of one or another sort are used at all of these points.

(To be continued.)

N. A. A. M. WILL TEST LICENSE LAWS.

The members of the executive committee of the National Association of Automobile Manufacturers placed themselves on record as favoring the institution of a suit for the purpose of testing the legality of the license laws, at a meeting held in New York on December 7, and appointed a committee to

confer with counsel and report at the next meeting.

It was decided to substitute a large smoker and entertainment on Friday of New York show week for the annual banquet, which has been abandoned.

The general manager reported on the allotment of show space. It was decided to subscribe \$500 toward making up the deficit in the Vanderbilt Cup race fund. Investigation of the present status of the Brownlow Good Roads bill and of good roads matters generally will be made by a special committee, which will report at the next meeting. Plans for future shows were discussed and referred to the show committee.

NEW AMERICAN MERCEDES CARS.

The Daimler Manufacturing Company is now busy at its works in Steinway, Long Island, with the first of the new American Mercedes cars, which it expects to have ready in time for the New York Show. These cars will be an exact reproduction of the German 1905 Mercedes, from the plans of the parent company in Germany.

The manufacture of the Daimler delivery truck, and also of the touring car marketed during the present year, has been abandoned, and in the future the energies of the company will be concentrated on the effort to equal the famous product of the Unter-Turkheim factory.

The Automobile Club of Argentina, recently formed at Buenos Ayres, according to latest reports, has enrolled more than 100 members.

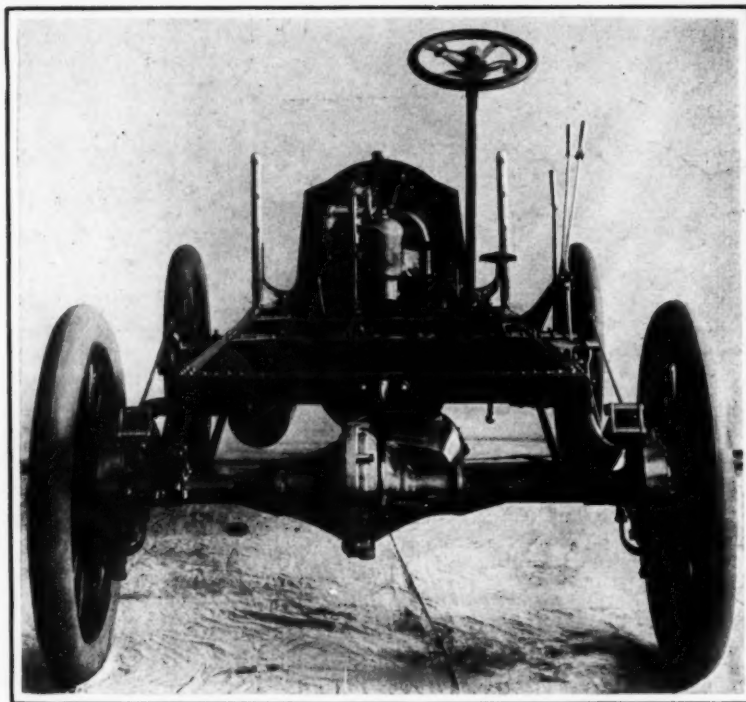


FIG. 5.—REAR VIEW OF PACKARD CHASSIS WITH SHAFT DRIVE.



FIG. 6.—FRANKLIN CHASSIS, SHOWING DRIVE BY SINGLE CHAIN FROM ENGINE AT FRONT OF CAR.

THE WINTER CARE OF AUTOMOBILES.

AT this season the automobilist who does not put his car out of commission for the winter should attend to a number of little matters to get the car into proper trim for cold weather running. In the first place, the water should all be drained out of the cooling system as soon as the weather becomes cold enough to start things freezing. It is surprising how the water in the machine will freeze when the temperature hardly seems low enough to congeal anything. Should only a small quantity of water be left in the system its freezing will not burst anything, it is true, but it may cause the pump to stick tight enough to break something when the unsuspecting automobilist puts too much strain on the starting crank in the endeavor to get the motor to turn over. The difficulty of cranking the motor that has been standing all night in the cold is considerable, as the lubricating oil is much thickened by the cold, causing every bearing and frictional point to resist stoutly the first pull on the crank, so that the driver would not notice the slight additional resistance due to the sticking of the pump.

* * *

Assuming that all the water has been drained out, the next step is to replace it with an anti-freezing solution. A majority of automobilists prefer a calcium chloride solution for this purpose. Glycerine solutions and alcohol solutions, as well as special oils, have been used, but all seem open to suggestions which cannot be raised against the calcium chloride. Glycerine rots the rubber tubing, and is itself decomposed by heat. The strength of the chloride solution will depend upon the point to which the temperature is likely to drop, and may vary from two pounds to a gallon of water to four or five pounds. A solution of five pounds to a gallon of water will withstand a temperature of 15 degrees or more below zero. Dissolve the calcium chloride completely before putting the solution into the tank; and it is advisable to strain it also. Be careful, in buying the stuff, that you do not get chloride of lime—a mistake which is not infrequently made.

If the solution when in use evaporates sufficiently to require replenishing, add pure water only, as it is the water that evaporates and not the calcium chloride, so that as the water evaporates the solution becomes more concentrated. The added water simply reduces it to its original strength. The solution should also be entirely replaced with fresh mixture about once a month.

* * *

Another matter to be given careful attention is lubrication. Oils thicken greatly in cold weather, and will not flow readily, if

it flows at all, through the feeds. Therefore a thinner oil should be used in winter than in summer. All dealers in automobile supplies keep winter oil regularly in stock, so no difficulty will be experienced in obtaining it. When making this change in oils would be an excellent time to give the motor a thorough flushing out with kerosene. Do not use gasoline for this purpose, and take particular care that oil feeds are well cleared, so that there will be no obstruction to the flow of the thin oil by the residue of the same lubricant.

* * *

The use of a poor quality of lubricating oil leads to a diversity of evils, apart from inferior lubrication. Carbon deposits will form on the combustion chamber walls, on the piston head and on the sparking points, and insulation of the plug. Ignition will be interfered with and finally stopped through short-circuiting across the insulation of the plug. The deposit may, in time, become so thick as to hold sufficient heat from one explosion to another to cause pre-ignition, which is liable to cause the motor to run with more or less "pound." If pre-ignition is suspected a test can be made by cutting out the ignition current. If this fault is not present the motor will stop; but if pre-ignition is occurring the motor will run without the assistance of legitimate aids to ignition. Shutting off the supply of fuel will bring the machine to a standstill.

In extreme cases the carbon deposit may cause pre-ignition in another way. If the compression of the motor is high, the reduction of clearance space owing to the deposit may raise the compression to such a point that the charge becomes self-ignited. While this is rather an extreme, it may happen in high-compression motors whose pistons and valves are in good condition and will hold the compression well.

* * *

Tires suffer severely if driven carelessly over rough, frozen roads. It is easy to ruin a tire by allowing it to run in frozen ruts and scrape itself down to the bare canvas on the sides of the tread. If there is snow on the roads it is wise to be provided with something to give the tires a grip on slippery surfaces. If you have no regular anti-skidding device, it is a simple matter to keep in the tool box a supply of small chain to wrap round the tires in case of necessity; even a rope will do, although this is subject to rapid wear if used on rough roads. Chains, while giving a good grip, are open to the objection that they are liable to cut the tires and that they scratch the paint of the felly and spokes. There are a number of anti-skidding attachments on the market that do not injure the tires, and will effectually prevent slip-

ping, while they save time and annoyance to the driver if the car is to be used extensively in the winter.

* * *

More flushing of the carbureter is apt to be required in starting in cold than in warm weather, but this should not be carried to excess. If the mixture is over-rich it will be necessary to work off the surplus by turning over the motor until the mixture is reduced to an explosive quality. Another cold weather hint is to drain the gasoline from the carbureter if it has been standing for some time, as it is apt to become "stale" and make starting difficult. Of course gasoline in the tank becomes stale in time, but that in the carbureter does so more rapidly owing to the small quantity contained in the float chamber.

* * *

High-tension current is a difficult matter to insulate, and will leak away through the most unlikely channels. If the ignition acts queerly and the trouble cannot be located in the usual ways, look for a high-tension leak. The elusive fluid will frequently follow oily wood or cloth, if given an opportunity, causing the most mysterious short-circuits and sometimes shocking the driver most unexpectedly. If you get a shock from an apparently impossible point, you may be sure there is a high-tension leak interfering with your ignition.

* * *

In purchasing tires do not accept any in which the rubber is unusually hard or unyielding. Tires will occasionally be found that are hard enough when new to stand up and retain their shape with but little air in them, but on the road they are sure to fall down miserably. Rubber should be pliable and full of life; when not it is almost certain to contain large quantities of foreign substances, or to be improperly vulcanized.

CHICAGO'S BIGGEST SHOW.

The fifth annual Chicago Automobile Show, to be held in the Coliseum during the week of February 4 to 11, promises to be of unusual importance. A number of novel features are promised by the manufacturers, and the interest aroused is expected to draw a large attendance of motorists. General Manager S. A. Miles states that all space has been taken, and the allotments are being cut down in order to accommodate more exhibitors.

The Chicago Automobile Club is taking an active interest in the show, and will aid materially in making the social feature a prominent one. A number of banquets will be given at the club house during the show, among them being that of the American Motor League and another by the two Chicago automobile weeklies, in honor of the visiting newspapermen from the East.

Correspondence

Tour Through Central New York.

Editor THE AUTOMOBILE:—

[120].—In the spring of 1901 John Maxwell, of Oneida, N. Y., purchased a Haynes-Apperson survey, securing State License 47, which still hangs on the rear axle. In 1903 he rebuilt it and put on some modern improvements, and the car made the trip of which a description follows, climbing all grades that were met and at times making a very rapid pace. Besides Mr. Maxwell, his friend, Mr. Frank B. Petrie, and the writer made the load.

On Friday, August 26, we left Oneida about 10 A. M. The country was in its richest dressing of summer verdure, frequent rains having fallen. At Munnsville we made an error, took the wrong road, and gradually rose to the top of the eastern side of the valley, yet we had nothing to regret; the view was beautiful and there was every indication of prosperity among the farmers. This is one of the greatest hop-growing regions in the United States, and the hop pickers were numerous. We gradually dropped down in to the Chenango Valley and reached Hamilton before noon.

After dinner at the Maxwell House, and securing some gasoline of a better quality, with an adjustment of the carbureter, we resumed our journey southward.

Soon we saw one of the evidences of advancement in transportation facilities, the Chenango Canal, abandoned some sixteen years ago, its bed being utilized by two railroad lines. As we moved out of Hamilton we were delighted with a brief view of the Colgate University. From Hamilton to North Norwich the road was made mostly of gravel, nicely graded and rounded up, and it was excellent. It follows the east side of the valley, and between Stockbridge and Hamilton is the summit; the grade from Hamilton to Binghamton is gently southward, excepting as it winds in and about the sides of the valley, and within a small space the waters flow northward to Lake Ontario and on the other slope southward to Chesapeake Bay. The towns and villages of this valley are clean, neat and tidy, with every indication of prosperity.

After ascending the hill at Chenango Forks, a hard climb, we found a very poor road for some distance; but from Chenango Bridge into Binghamton, with one mile of State road, it was unusually good. Much of it was on the old tow path of the abandoned canal.

The route from Oneida to Binghamton presents a pleasant variation of scenery, and one swings from one side of the valley to the other and along the sides with romantic curves and very little hill climbing; it is really an ideal run. We arrived at the Bennett House in Binghamton about 7 P. M., after about a hundred mile run. The

Binghamton Automobile Garage is about as near perfection as can be, and we were most hospitably received; many large and expensive cars are owned there.

Saturday morning, shortly before 10 o'clock, we left Binghamton headed westward. The road to Owego is good, four or five miles of the State road just outside of Binghamton being fine. We took the road on the south side of the river, crossing to the north at Owego for dinner, after which we resumed our journey on the south side until we arrived at the Smithboro bridge, then continuing to Waverly. The little brook which we passed at Hamilton had joined long ere this with the broad waters of the Susquehanna River, and the hills on each side of the valley were high and precipitous; on the low lands farmers were cutting tobacco and preparing it to dry.

We reached Elmira by a road which was good, bad and indifferent, and stopped at the Elmira Arms Company garage, where a few supplies were secured. Then we sped along the Chemung Valley, which had been entered near Waverly. About the finest scenery on the trip was on the slope in the valley leading to Seneca Lake, though the road was one of the poorest. Here again was a summit with the waters flowing north and south to the same points mentioned above. We arrived in Watkins just at dusk. Two experiences to-day both amused and annoyed us; we met six horses and buggies, in each of which were two ladies and one or two infants, and all within six miles; at another point we met a Sabbath-school picnic in fifteen or twenty different kinds of horse-drawn rigs, containing ladies and children. We stopped, shut down motors, and received the thanks of the superintendent and several of the ladies.

After dinner Sunday afternoon we started north from Watkins on the west side of Seneca Lake, finding fine views of the lake, glens and hills, but miserable roads, until nearing Geneva; the last seven miles were smooth and good, and we were registered at the Nestor House about 4.30; Geneva has a number of well paved streets, and is a busy little city.

On Monday morning, August 29, at 10.30, we passed around the foot of Seneca Lake, along its eastern shore to Willard State Hospital over a very inferior road; but after entering the grounds we found a smooth road, as we did from there to Oneida. We dined at the Franklin House at Ovid, then passed along to Farmer, thence down an easy grade to Kidder's Ferry, west shore of Cayuga Lake. The Busy Bee ferry boat seemed to us to be getting "dronish," but it carried us safely over two and a half miles of clear water to Kings Ferry, Cayuga County, where we had a hill climb of about a mile; but twenty-one miles of level road northward to Auburn were smooth enough, so that at times we had to be careful not to exceed speed limits. Tourists going westward

will do wisely to take this route, passing through the center of Seneca County to Geneva.

The beautiful city of Auburn was left behind on Tuesday morning, and we toured over fairly good roads, and after lunch in Syracuse, moved on to the place of starting—Oneida. While on the road we were held up by a threshing machine party, who had their driving belt across the highway, refusing at first to take it down, and advising us to take the field around them; only after threatening to cut the belt would they make a passage way for us.

We arrived at Mr. Maxwell's garage about 4.30 P. M., after a most enjoyable trip, having met with no mishaps nor accidents of any kind.

Our observations made us unanimous in one opinion, that the great river valleys provide far better and more level roads than the lake region, which abounds in hills, glens and gullies, making it necessary to climb many steep hills; although the scenery repays one for the wear and tear on motors and tires. The odometer marked 386 miles, and the speed ranged between 10 and 20 miles per hour. The eleven counties traversed were Madison, Chenango, Broome, Tioga, Chemung, Schuyler, Yates, Ontario, Seneca, Cayuga and Onondaga.

S. C. TALLMAN.

Auburn, N. Y.

A Progressive Farmer.

Editor THE AUTOMOBILE:—

[121].—Others of your readers will no doubt be interested, as I was, in reading the enclosed letter of one farmer of Charlotte, Vt., in reply to a letter from another farmer—Mr. Higbee—of the same place, who complained bitterly of the frightening of horses by the use of automobiles on the roads hereabouts, and suggested that they should be excluded altogether or their use hedged about by the utmost restrictive legislation. Both letters were printed in the *Burlington Free Press*. Mr. Johnson's answer to Mr. Higbee shows breadth of mind not usually displayed by inhabitants of the rural districts, who have so long enjoyed the all but exclusive use of the roads as apparently to have grown into the belief that travel upon them by any other means than by horse and wagon or carriage is an infringement of their especial rights.

M. H. S.

Burlington, Vt.

THE FARMER'S LETTER.

I am deeply interested in all things which concern the farmers of this county, as I have the honor of now being called farmer, myself; and I therefore beg to say a few words in behalf of the automobile which I believe is destined to be of great value to the farmer.

At present, automobiles are chiefly pleasure vehicles, and are in the experimental stage, which keeps the price of an automobile beyond most of the farmers; however, owing to the large number sold, automobiles are being built cheaper and more prac-

tical every day, so that it is only a question of time when a good automobile will be as cheap or cheaper than a span of horses, besides costing less to maintain and taking less time for care. * * *

The large majority of automobile owners are careful in running their machines, but of course there are always a few who, owing to their selfish or careless manner of operating, have brought down upon the heads of the autoists a multitude of curses. If this class of people were punished by imprisonment instead of fines, we would soon hear little complaint, for the man that is able to own a first-class automobile nowadays, is able to pay fines every day in the year; whereas the disgrace and sobering influence of a few days in the county jail would tend to give these careless operators a new view of things.

One of the greatest needs of rural communities to-day is good roads, and nowhere is this better illustrated than in the town of Charlotte. Autoists are doing everything in their power to secure better roads, especially in the rural parts of New England. Doesn't this benefit the farmer? What if some of his horses are afraid the first time they see an automobile? It will do both the horses and the farmer good to get acquainted with automobiles. It will take patience and perhaps a little hard work to get acquainted, but it is certainly worth the trouble.

One of the most interesting farming exhibits at St. Louis is an automobile mowing machine. There are also many automobile trucks, and even plows are exhibited which will lighten the labor of the farmers of this coming generation. Of course the farmers will require more education to run an automobile mowing machine than they would to swing a scythe, but the benefits will be put before their eyes in the shape of bright, round American dollars which the farmers are now getting after faster than ever before.

But the greatest benefit of the automobile is the saving of time of which the farmers are now beginning to realize the value.

CHAS. E. JOHNSON.

Charlotte, Vt.

Home-Made Crane Patented.

Editor THE AUTOMOBILE:—

[122].—We respectfully call your attention to the fact that we are the owners of certain Letters Patent of the United States, the claims of which cover such construction as is shown and described in the article, "Home Made Auto Crane," in your issue of November 19, and that we must protect our rights under said patent.

We assume that the manufacturers of the crane referred to in said article were not aware of the existence of our patent, and need only to be informed thereof to cease the manufacture of the crane.

We believe that you will willingly publish this communication for the protection of your readers.

FRANKLIN PORTABLE CRANE & HOIST CO.

Franklin, Pa.

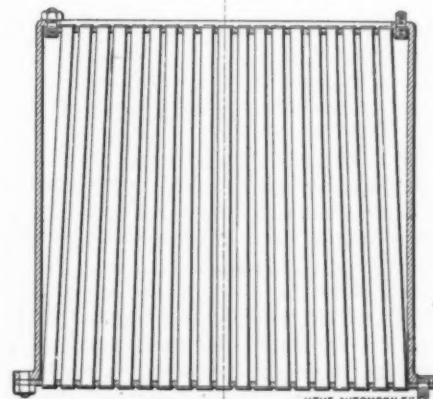
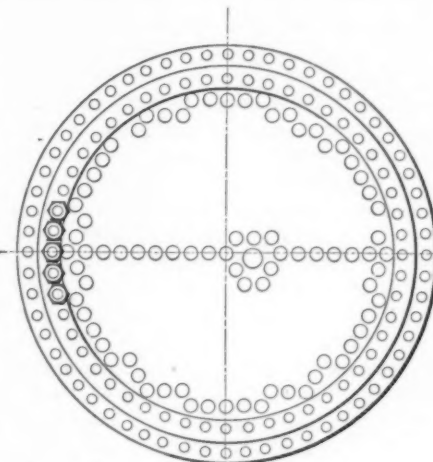
Our understanding of the situation in connection with the home made crane illustrated and described is that the manufacturer made one merely for his own use, and, so far as we know, has not attempted to market the device. The builder probably did not know of the existence of the patent mentioned in the letter above.

Boiler for Runabout.

Editor THE AUTOMOBILE:—

[123].—In the reply to "A.A." in your issue of October 29, page 503, there are, I believe, some errors that should be corrected since the inexperienced individual has plenty to contend with even with the best advice. In the first place, he is left to believe that a boiler 20 inches high will be all right in a steam carriage, since it is not commented upon. Very few light car bodies would allow such a high boiler between seat and engine chain. Again, a boiler 14 inches diameter and 13 inches high will furnish with a good burner all the steam a runabout can use on the road.

Regarding thickness of tubes, I have yet to learn of one maker advertising heavier



BOILER 14 BY 13 INCHES EASILY CLEANED BY REMOVING SHELL.

than 20 gauge half-inch tubes, which are .035 inch thick, whereas you advise the use of 14 gauge or .083 inch thickness. We are assured by the makers that 20 gauge tubes will stand from 1,000 to 1,350 pounds boiler pressure, and I have tested them to 800 pounds. That is much higher pressure than is needed in a steam runabout, and 20 gauge tubes, which are more than double the thickness of 14 gauge tubes, cause corresponding inefficiency from radiation and decreased area through tubes.

I enclose blue print to scale of a 14 by 13-inch boiler, that I made for my car, with 238 5-8 inch 18 gauge tubes, which has the advantage of being easily cleaned by re-

moving the shell from the heads and tubes. The studs in the top are shown pitched too close; they should be about one inch centers; top ends of tube were swaged to 9-16 inch to allow for decreased spacing made necessary by the top joint. Three hundred 1-2 inch tubes could be easily spaced in the top head about 11-16 inch centers without swaging; bottom tube head, 3-4 inch centers. I have a home-made burner of 1-8 inch gas pipe and cannot use all my steam on the road. Have standard 2 1-2 inch by 3 1-2 inch Mason engine.

W. G. LUPER.

Vallejo, Cal.

To Stimulate Club Interest.

Editor THE AUTOMOBILE:—

[124].—Club officers and committeemen throughout the country are frequently confronted with the seemingly impossible task of keeping interest of the members actively alive through the winter months, when the cars are used less and business and social affairs are at their height. While club elections, weekly meetings with their lectures, and bowling and billiards attract a number of members more or less regularly, it is a common objection that these things draw out only a fractional part of the membership.

Friendly competition, in whatever direction, is one of the best stimulants to human interest. The house committee would probably find that one of the most effective ways of awakening the driving spirit and club interest among the members would be to start a mileage competition open to all. A bulletin board could be put up on a wall of the club room and a record kept of the total mileage of the members leading in the competition. A feature of each week's meeting would be the reports of the members of the mileage recorded by their odometers up to that evening. The placing of the names and distances on the bulletin board would give occasion for much good-natured bantering and railery, and the ambition to head the list or surpass some friend would not only bring the members to the clubhouse to see how others progressed, but would also be an inducement for the more frequent use of their cars.

Other competitions could be arranged with the purpose of determining the lowest percentage of maintenance and repair cost to first price of the car, and to evolve the most economical user of fuel per mile traveled.

To make the weekly meetings of practical value to the members, small prizes or blue ribbons could be offered for the most practical written hint on emergency repair on the road, on manipulation of the car in cases of skidding, on anti-freezing solutions, and a variety of similar subjects.

Chicago.

W. N.

Arrangements are now being made for the establishment of a large automobile race track at Berlin.



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Fire Prevention] In the Garage.

The fire which destroyed one garage, and for a time threatened the principal garage district of New York and the large theaters and hotels adjoining, last Monday, is evidence that such institutions are not always guarded with that excess of vigilance which alone is a guarantee of safety. While those in charge of the garage offer no explanation of the immediate cause of the disaster, the main points show on the surface. A gasoline tank wagon was discharging gasoline into the garage tank, and in some manner the gasoline became ignited, the driver of the wagon started up immediately, without waiting to shut off the cock, and the trailing hose scattered the oil in all directions.

Anyone at all familiar with the average conditions existing in too many establishments of this kind will have no trouble in assigning several probable causes for such an occurrence. The omnipresent cigar and the still more numerous and dangerous cigarette have found in the modern garage even a wider field of destructiveness than they have enjoyed in the past in theaters

and other public buildings of only average inflammability; and in addition to them there is the electric current everywhere, on walls and cars.

Another element of danger in the garage as compared with most other buildings usually rated as extra hazardous, is the regular use of gasoline for cleansing purposes.

Only a short time since, within the limits of this same block, there occurred a fire that is almost typical of conditions that are entirely too common. While one mechanic was cleaning a motor with gasoline from an open pan, another was overhauling the sparking apparatus, the two thus deliberately producing in the center of a crowded garage the identical conditions of vaporization, mixture with air, and spark ignition that are supposed to be confined most rigidly to the interior of the motor. That the resulting fire was subdued before it had done any more damage than to burn the paint from the one car and to injure the wheels was merely a matter of good luck.

The automobile storage establishment is an absolute necessity in every large city; it cannot be banished to the suburbs, for it must be convenient to business or residential centers; and it cannot exist without a liberal supply of gasoline. From the narrowest viewpoint of self interest, the proprietors of such institutions owe it to themselves, if not to the public, to observe every possible precaution against fire; apart from immediate loss of life and financial damage, every disaster such as that in question must have its effect in raising insurance rates and drawing closer all municipal restrictions.

The first element of safety is a definite system of authority and discipline by which the rules of the garage are stringently enforced at all times. There should always be present some one person whose duty it is to enforce the rules; if this task be divided among several persons or left to chance, all discipline will relax.

There should be a rigid regulation of the use of gasoline, whether in filling the tanks of cars or in using it for general purposes about the storeroom and shop; in particular, special precautions as to general cleanliness and the total absence of lights should be taken whenever the main reservoir is replenished from the supply wagon.

Second only in importance is the matter of general cleanliness—the prevention of accumulations of dirt and waste in corners and closets, the immediate removal of gasoline and oil from the floors, and the maintenance of order and neatness throughout the establishment. With floors, lockers and closets in proper order, and with all oil and gasoline confined to their reservoirs, the possible danger from an accidental spark of any kind is reduced to a reasonably safe minimum.

There is no guarantee of safety in the mere posting of placards prohibiting smoking, even though phrased in several languages; the only safety lies in the rigid

enforcement of the rule by one central authority. The abolition of smoking will doubtless work a hardship to many, but it has been found necessary in the case of theaters and similar institutions, and sooner or later it will probably be made a legal requirement in the case of garages in the central portions of cities.



Special Cars for Commercial Use.

A subscriber connected with one of the telephone companies in the Middle States writes us to suggest a yet undeveloped field for the practical use of automobiles which seems to have somewhat more immediate promise of success than is sometimes the case. His company has for several years been experimenting with motor vehicles in the repair and maintenance of its long distance wires with seemingly a fair measure of success considering the fact that the vehicles used have been light runabouts not meant for commercial use, and he declares that telephone companies throughout the country would gladly adopt a machine of simple but high-class construction, equipped with a perfectly plain working body and devoid of all decorative frills and expensive finish. Such a car, seating one or two persons and provided with compartments for carrying a couple of telephones, wire and light repair tools, would be used in country work where regular transportation lines were inconvenient, and would be operated, we may suppose, by the "troubleman" himself, whose mechanical education could easily be stretched to cover this new requirement. Our correspondent names \$1,000 to \$1,500 as the price of such vehicles as it would now be necessary to purchase to answer the requirements, and seems to imply that if the money spent on carriage work and the expensive refinements of the pleasure vehicles were saved the purchase price could be made a great deal less.

That there are here two distinct propositions is evident. The motor vehicle may be well adapted to the line of work noted, and even distinctly economical, without being particularly "cheap" in first cost. As a matter of fact, we question if in the present state of the art, or even three or four years from now, a satisfactory car for such a service can be bought for less than \$800 or \$1,000. The lack of eagerness so far shown by automobile builders to enter the commercial field is after all based on the most hard-headed business sense. They are simply waiting till their experience with pleasure vehicles has shown them how to build genuinely successful commercial vehicles.

The man out for a spin does not reckon in dollars and cents time spent in trouble, but when a delivery wagon is laid up for an hour or two by the road it makes a deep cut in the working efficiency for that day. The goods are delayed, the vehicle is out of commission when it should be earning money, and the driver's time is likewise lost. To save such losses so far as possible, it is necessary to employ skilled driv-

ers, and until the supply of these comes within gunshot of the demand fancy wages and irresponsible men will be the rule. In the large cities, indeed, it has been found difficult to maintain delivery service with anything but electric vehicles, because as soon as a boy or man is broken in to run a gasoline machine he gets a job as chauffeur or repairman at double or treble his former wages, and the heart-breaking process of breaking in must be repeated.

Again, it is easy to dwell too much on the supposed high ratio of decorative work to useful work on an automobile. No ordinary body costs one-fourth as much as the chassis on which it rests, and many of them probably cost less than one-eighth. Some of the finish might be left off from the mechanism, but the much-talked-of "simplicity" of the future commercial vehicle is largely imaginary. If manufacturers knew how profitably to simplify their present machines they would do so.

If now we glance again at the telephone field, we will see that its especial recommendation, from the present point of view, is that little departure would be needed from present type of vehicles, because time-saving would be an object, and a car able to make less than 20 miles an hour would not be worth considering. Why would not it be a good idea to furnish for this work a standard car with special working body, and either fit a smaller motor or simply reduce the power of present motor types by suitable changes in design? Such a car would have the best possible chance of a long and useful life.



There is at the present time a marked effort on the part of the more prominent individuals and the governing bodies of the automobile world to secure a general compliance with the law, and to go even further in restraining all users of the automobile within the broad limits of fair play and manly courtesy.

Under such conditions it would seem that some spirit of recognition and reciprocity might be looked for in those who make and administer the law, but the tendency in too many cases is not to detect and punish the guilty, but to annoy and oppress all motorists.

An instance to the point is found in the bill now before the Vermont Legislature, with a fair prospect of passage, as told in our news columns this week. Some of the provisions of this bill are not only objectionable in themselves, but more archaic and out of date than those enacted in the first years of the automobile, marking a distinct retrogression in road legislation.

No proper understanding will be reached among road users until each class recognizes the rights of all others, and no good, either temporary or permanent, can come from such legislation as this, recognizing the rights of those who use but one means of travel.

FIRE IN NEW YORK GARAGE CENTER.

Eleven Men Injured by Jumping from Windows of Burning Standard Garage and Forty Expensive Cars Badly Damaged—Tank Wagon Spread the Flames.

Fire destroyed the garage of the Standard Automobile Company at 146 West Thirty-ninth street, New York, on Monday, December 4. Automobiles stored there were damaged to an amount estimated at \$150,000, some being practically destroyed and others escaping with the loss of the bodies. So rapidly did the flames spread that twenty men who were working on the second floor were cut off from the stairway and were forced to jump from the windows to the pavement below. In doing so eleven were injured, one man breaking both legs, three breaking their ankles, and the others suffering sprains, bruises and burns of more or less severity. They were taken to the Bellevue and New York hospitals, where all are doing well.

There is nothing to show just how or where the fire started. The facts, so far as known, are as follows: A gasoline tank wagon had drawn up in a narrow lane at the rear of the garage and was running gasoline into the large outside underground tank in which the fuel supply was stored, when an employee in a second floor window noticed a slight blaze near the tank opening. He shouted to the driver of the wagon, who, without trying to extinguish the blaze, or even to turn off the stream of fluid, whipped up his horses, dragging the hose from the opening and throwing a flood of gasoline into the fire. Instantly there was a roar of flame, and the entire end of the building was ablaze, the tank wagon, however, just getting clear in time. Escape by the stairway being cut off, the men on the second floor jumped from the front windows, some in their haste almost diving into the street. Others, less excited, hung by their hands from the coping and dropped carefully, escaping with little or no injury. The building was a wood and brick structure, and burned like tinder. By the time the fire apparatus arrived on the scene it was impossible to save the garage, and the efforts of the firemen were directed mainly toward preventing the spreading of the flames to adjoining garages.

The Cadillac garage, which was next door, was quickly cleared of cars, which were lined up in the street; but practically no damage was done to the building, and the machines were returned to it after the fire was extinguished.

There were thirty-five cars on the lower floor of the Standard garage which burned, and six on the floor above undergoing repairs or in storage. Only one car was saved, that being the property of Mayor McClellan, which was pushed out. Owing probably to the fact that one hub tore a splinter off the doorway as it went through, it was reported in one of the daily papers that the chauffeur did the marvelous stunt of driving his car at full speed through the closed doors, without any damage resulting beyond a slightly bent fender.

Many of the machines were insured, although there were nearly a dozen on which no insurance was carried. After viewing the ruins of the machines in the Standard garage several owners of cars stored in other garages hastened to take out policies. Eight or ten of the machines can, it is said, be repaired. The remainder are thought to be total losses, although possibly a more

careful inspection will show that the damage to some of the cars thought to be destroyed is not irreparable.

Peter Cooper Hewitt's racing car, said to have cost \$30,000 to build, is among the badly damaged cars, as was also a 70-horsepower Panhard belonging to C. C. Herman.

Sensational stories about gasoline explosions were freely circulated during and after the fire; but inquiry elicited the information that the only explosions that occurred were due to bursting tires. Some indignation was expressed regarding the action of the firemen, who slashed their axes into tires to prevent their exploding from the heat. The gasoline tank, it is stated, did not explode, and was found after the fire to contain the gasoline that had been run in. No gasoline was stored inside of the building. There were in the garage several barrels of lubricating oil, which were unaffected by the flames.

Earlier in the day a slight fire had occurred in the building, but it was quickly put out with the aid of fire extinguishers. Some of the men had hardly recovered their composure when the second fire started.

The Standard garage is in the heart of the automobile business district, and the progress of the conflagration was watched with anxiety by automobile men in the neighborhood. E. T. Birdsall and E. S. Partridge, president and vice-president of the Standard Company, are in Paris, having gone over to see the automobile show. The news of the fire was cabled to them at once by Acting Manager Weaver.

A. A. A. OFFICERS NOMINATED.

President Whipple Consents to Serve Another Year—New Clubs Admitted.

All of the officers of the American Automobile Association were unanimously re-nominated at the meeting of the Board of Directors, held at the rooms of the Automobile Club of America, in New York, on Tuesday, December 6. There was doubt at first as to whether President Whipple would accept the nomination, being a man of many affairs, and moreover residing near Boston, but he yielded to persuasion. The election will take place at the annual meeting in New York on January 14, the opening day of the Madison Square Automobile Show.

On the board of directors the names of Dave Hennen Morris, W. C. Temple, H. L. Lippitt and C. G. Burgoyne replace those of Dr. Julian A. Chase, Samuel H. Valentine, Barclay H. Warburton and Dr. W. E. Milbank.

A proposition was made to amend the constitution so as to allow every affiliated club having a membership of fifty or more to be represented, instead of electing seven directors, four to constitute a quorum, as at present. It was also proposed to make the second and third vice-presidents, as well as the president and first vice-president, ex-officio members of the board.

Forty-two clubs are now members of the association, five having been elected at the nomination meeting; as follows: Binghamton, Geneva and Chenango county, N. Y., and Dallas and Houston, Texas. This shows an increase of twenty-six clubs over last year's list.

Holland has abolished all restrictions regarding speed of automobiles in the country, except driving to the danger of the public, thus placing the entire responsibility upon the driver, as is the case with horse-drawn vehicles.

PROPOSED VERMONT LAW OBJECTIONABLE.

Requires Motorists to Stop Cars Within Respectful Distance of Every Horse, Grants Local Option in Speed Regulation and Provides for Cumulative Records of Convictions.

A bill introduced by Mr. Campbell, of Rockingham, and known by his name, is now before the Legislature of Vermont, having been reported favorably with amendments and being favored by a majority of the House of Representatives. It is designed to supersede the existing law, which is brief, and, in addition to requiring licensing and numbering, it introduces some new and particularly objectionable ideas in automobile legislation.

The bill calls for the registration of all automobiles and the licensing of operators, the fee being \$2; for the extension of privileges to non-residents and their cars, and for speed limits of fifteen and ten miles; the penalties being revocation of license or certificate, and fines of from \$25 to \$100, with not more than ten days' imprisonment.

For the usual provision requiring the stopping of a car upon notice from a driver of a horse is substituted the following:

"Upon all highways outside of city or village or thickly settled portion of a town or fire district, the operator of such automobile or motor vehicle shall stop such automobile or motor vehicle not less than seventy-five feet from any approaching vehicle drawn by a horse or horses, or a horse upon which any person is riding, and shall not proceed further until such driver or rider of such horse or horses shall have passed said automobile or motor vehicle or have reached a place of safety, unless such rider or driver of such horse or horses shall signal the person having in charge such automobile or motor vehicle to advance."

The detail of administering the added penalty prescribed for a second offense seems to be very fully provided.

"The Court convicting any person of violating any of the provisions of this Act shall at once notify the Secretary of State of such conviction, with the number or mark of the machine, owned or driven by him, and all other information obtained. This shall be recorded by the Secretary of State, and if at any time it shall appear that any person, owner or driver of an automobile, or motor vehicle, used in different cities, villages or towns of the State, has been convicted of a first offense in more than one court in the State, the fact of this conviction shall be deemed a second or subsequent offense, and the person, owner or driver shall be subject to further prosecution by the Secretary of State."

With the interests of the horse-drivers thus amply safeguarded, it would seem that nothing more were necessary, but the final section of the bill opens a wide door for all sorts of supplementary local legislation, inviting further onerous restrictions, as follows:

"Nothing herein contained shall be so construed as to affect the rights of boards of aldermen of cities, selectmen of towns or trustees or bailiffs of incorporated villages to make special regulations as to the speed of automobiles and motor vehicles, and as to the use of such vehicles upon particular roads or ways, including the right to exclude them altogether therefrom. Such exclusion, however, shall be subject to an appeal to the Secretary of State, whose decision in the case shall be final.

No such special legislation shall be effective unless notice of the same is posted conspicuously at the points where any road affected thereby joins other roads."

It would appear from the above that the standard speed limits of the bill—fifteen in the country and ten miles in towns—are not of necessity universal throughout the State, but may be nullified by the adoption of still lower limits by local authorities.

AMENDMENTS CRITICISED.

Blow Aimed at New York and Philadelphia Motorists by Jersey Assemblyman.

Special Correspondence.

PHILADELPHIA, Dec. 5.—Automobilists here are commenting rather unfavorably upon some of the proposed amendments to the automobile laws to be introduced by Assemblyman Harry Scovil at the next session of the New Jersey Legislature. To "compel" an automobilist to carry but one tag on his automobile is, they assert, unconstitutional; to carry the tag of the state in which he is at the time traveling over is the most that any state officials may insist upon. What other numbers or tags the automobilist may carry, these critics say, is beyond the officials' jurisdiction, so long as he does not carry "fake" numbers with an evident intention to confuse the authorities.

In south Jersey especially towns are comparatively few and far between, and the roads oftentimes run through mile after mile of sand barrens, with not a single human habitation in sight. To reduce the present twenty-mile-an-hour maximum speed rate through such sections, as proposed by Mr. Scovil, would be nonsensical, it is held. It seems evident from the tenor of the proposed amendments that they are aimed almost exclusively at New York and Philadelphia automobilists, and that some such anti-automobile plan of campaign as is at present in force in the townships to the west of this city is contemplated. If such be the case, automobile travel from the Quaker City to the various shore resorts next summer will be anything but an unalloyed joy.

FIRST 60-H.P. THOMAS TRIED.

Special Correspondence.

BUFFALO, Dec. 5.—The first Model 27 60-horsepower Thomas Flyer was given a road trial last Saturday. Designer Schultz held the wheel as the big six-cylinder car was driven over the snow and ice-covered roads in the vicinity of the factory.

This car is the property of Major C. J. S. Miller, a Franklin, Pa., yachtsman, soldier, horseman and automobilist, and makes the seventh auto for his stable. Major Miller has entered the new car for the Florida tournament, and will drive the machine himself on the Ormond-Daytona beach as well as on road and track next summer.

Duplicates of this car have been ordered by Walter M. Jermyn, a Scranton coal magnate; Charles S. Henshaw, who is now making arrangements to race it against a locomotive on one of the railroads entering Boston; Harry S. Houpt, whose four-cylinder Thomas won the recent free-for-all at Waverley, N. J., and later won Class 6 event in the Eagle Rock Hill Climb, and by several persons who want the machines for touring exclusively.

Everything is moving along smoothly in the Bates automobile murder mystery. Chicago reports the regular failure of a clew yesterday.—*Indianapolis News.*

INTERNATIONAL RACES FOR BAVARIAN CAPITAL.

Contests in Speed, Reliability and Hill-Climbing for Touring and Racing Cars Arranged for the Professor Von Herkomer and Baron Bleichröder Trophies.

There has just been issued the preliminary program of a varied and extended series of international competitions which will be held in August next at Munich for prizes offered by two German motorists, Prof. von Herkomer and Baron James Bleichröder. The competition, which is open to all members of clubs affiliated with the German Automobile Club, and in Germany with the Deutsche Automobil Verband, is under the management of the Bavarian Automobile Club in cooperation with the German Automobile Club.

The Herkomer prize competition is open to four-seated touring cars, the first event being a public exhibition of one day in Munich, with a competition for utility and beauty of bodies. On the second day there will be a hill-climbing contest over a 7-kilometer course on the Kesselberg, near Munich, and on the third day a speed trial over a 6-kilometer course on the level in the Forstenrieder Park. Following these will be a three-day reliability trial, the routes being: First day, Munich Bruck, Augsburg, Ulm, Tübingen, Baden Baden. The distribution of the prizes will take place on the seventh day. Each car in the reliability trial will carry an observer.

The Bleichröder competition, which follows immediately after, is for racing cars, and will occupy two days, the first devoted to a trial of the Kesselberg hill, the second to speed runs over the 6-kilometer course in the Forstenrieder Park, the cars being started singly and the prizes awarded on the basis of the best average time. It will be open to cars of not over 1,000 kilograms weight (with an extra 8 kilograms allowed for magneto-ignition), the different parts not being of necessity made in the country of the club represented.

The Herkomer prize is a trophy costing at least 10,000 marks (\$2,500), and in addition the portrait of each winner painted by Prof. von Herkomer and valued at about an equal sum. In addition, a silver trophy costing 1,000 marks is offered by H. R. H. Prince Ludwig Ferdinand of Bavaria to the car making the best average in the hill-climbing and speed trials; in the event of a tie, the prize to go to the winner of the hill trial. A silver trophy costing 1,000 marks will also be given by the German Automobile Club for the handsomest and most practical body. The Herkomer prize is to become the permanent property of the first competitor who shall win it twice within three years; if won by a different competitor each year, at the end of the third year the three shall draw lots for it. To the winner of 1905 will be awarded a special prize, a work of art by the sculptor, von Gohsen, valued at 2,000 marks, presented by Dr. Magin in the name of the Bavarian Automobile Club. Entries for the Herkomer trophy will close on May 31, 1905. The cars and bodies need not be built in the country of the entering club. The entrance fee is 300 marks.

The Bleichröder prizes are 8,000 marks in cash, with a second prize of 2,000 marks. Entries will close on June 30, 1905.

The management of the competitions has been placed by the Deutsche Automobil Verband in the hands of Count Sierstorff. Dr. Levin Stoelting and Baron Bronden-

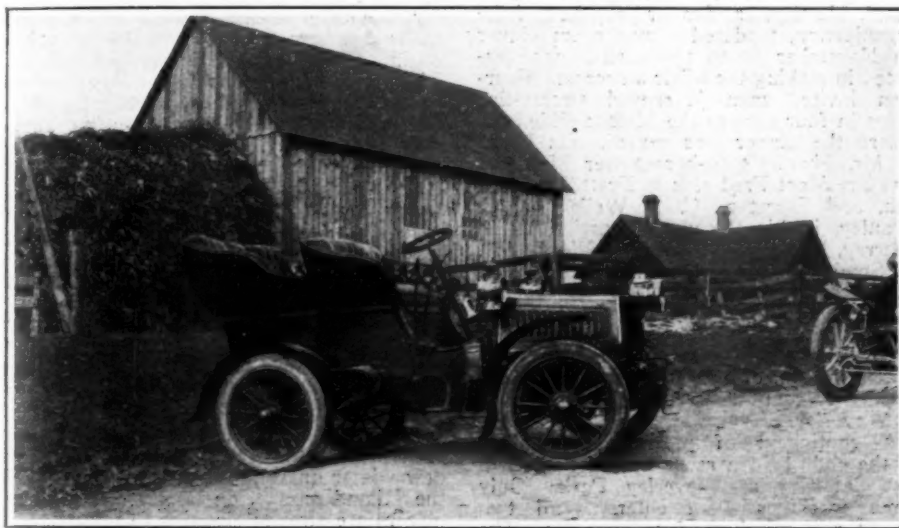
stein, of the German Automobile Club, and Count C. Schönborn, Baron Schrenck-Notzing and Louis Poehlmann, of the Bavarian Automobile Club. Details will be furnished on application to the Secretary of the German Automobile Club, Sommerstrasse, 4a, Berlin, or to the Secretary of the Bavarian Automobile Club, Turkenstrasse, 98, III, Munich, Bavaria.

GREELY RECOMMENDS AUTOS.

Army Signal Officers Believe Them Valuable for Military Purposes.

Special Correspondence.

WASHINGTON, D. C., Dec. 5.—In his annual report, just submitted to the Secretary of War, General Greely, chief signal officer of the army, states that the evident value of self-propelled vehicles as parts of telegraph and balloon trains has led him to continue experiments with automobiles. While automobilism in its present state is evidently unsuited for general transportation in the field, the experiences of the Signal Corps, he says, have demonstrated the practicability and advisability of self-propelled vehicles for special military purposes.



CAR AND PLACE IN WHICH CHAUFFEUR BATE WAS FOUND SHOT DEAD.

poses. General Greely adds that experiments in foreign armies likewise confirm this opinion.

While the good points of electric and steam vehicles are thoroughly recognized, yet the internal combustion type, using kerosene or other oil, seems better suited for war purposes in the opinion of the chief signal officer. This type, he says, has especially valuable features from a military standpoint in its small fuel and water consumption, an essential quality for reliable service in field operations.

EXPORTS FOR FOUR MONTHS.

Comparative exports of American automobiles during the months of July to October, inclusive, in 1903 and 1904, were as follows:

	1903.	1904.
July	\$159,739	\$183,180
August	171,132	168,303
September	143,518	123,487
October	119,131	130,891

An automobile from Morrison and its occupants called at Glenwood farm one day recently. It isn't every farm that has the distinction of entertaining an automobile party.—*Morrison (Ill.) Sentinel.*

MURDER STILL A MYSTERY.

Chicago Police Unable to Find Motive or Author of Bate Crime.

Special Correspondence.

CHICAGO, Dec. 3.—The mysterious automobile murder on Archer road, twenty-five miles from Chicago, where John W. Bate, a chauffeur, was shot while driving a passenger who hired the machine at the Auditorium hotel, is still far from a solution. Detectives who have worked on the case for two weeks have made practically no progress. "Mr. Dove," the name given by the passenger, has not been located.

Why Bate should have been killed by his passenger, who did not call for the chauffeur by name, and who was unknown to him, is a question that half a dozen theories have been advanced to answer. Bate was a young man about twenty-one years old. He had been employed about Canary's garage for a year. He had no love affairs that "Dove" could have been interested in. There was no apparent connection between the two men.

"Mr. Dove" rode away from the lake front hotel about 9.30 o'clock in the even-

George W. Hugg, an ex-convict of Chicago, had often employed the name of Dove as an alias;

Hugg was near the Auditorium hotel a few minutes before a man who said his name was Dove ordered the automobile from the garage.

There the police stop. All search for Hugg or Dove have been fruitless. He has been reported as seen in twenty different places since the evening of the murder. He was described by the telephone boy who took the order as of slight build, about thirty-five years old, with smooth face, blue eyes, and wearing a light overcoat and red neck scarf. Every one who is of slight stature and has worn a red scarf and light top coat has been under suspicion. This style of dress is now on the decline about Chicago.

Archer Road, made famous by the Dooley stories, has been visited daily since the murder by hundreds of automobilists. On Sunday from early in the day until late at night there was a constant procession going to and coming from the place where the machine was found. About the various garages the one subject discussed has been the mystery of this murder. It is probable that Hugg can not long escape the police. Whether his arrest will solve the murder or not is a question. The probabilities seem to be that it will not.

TRACKLESS TROLLEY CAR.

New Type of Passenger 'Bus to Use Batteries or Overhead Wires.

Special Correspondence.

BUFFALO, Dec. 5.—A big trackless trolley car to be used in passenger service in Salamanca, N. Y., was completed in this city several days ago by the Auto Car Equipment Company. It was given a trial run in Buffalo last Tuesday, and at that time was operated by means of a storage battery. Two other similar cars will be shipped to Salamanca in a month.

The car is 15 1-2 feet long and 6 1-2 feet wide. It has glass vestibules at both ends and a permanent wooden roof. The six seats are placed crosswise and the car is open like a summer trolley car. There are self-acting curtains at either end of the seats so that the car can be wholly enclosed in case of storm. The normal seating capacity is 24 passengers. The motorman occupies a seat inside the vestibule. The car weighs three tons and the wheels are equipped with heavy rubber tires. The interior is lighted with incandescent lights and there is an electric headlight. The maximum speed is twelve miles an hour and the storage battery will run it for forty miles.

In operating the vehicle as a trolley car the storage battery will be supplanted by a flexible wire that will slide on a double trolley wire overhead. One wire will be a conductor and the other will complete the electric circuit. The flexible wire loop will be arranged to give the car a running radius of eight or ten feet on either side.

Several prominent men are interested in the concern which will operate the trackless trolley system, and which is known as the Salamanca Electric Traffic Company.

She—"Been drinking, George?"

He—"No, dear."

She—"Why are you chewing cloves, then?"

He—"Oh, I've been riding with a friend in his automobile and I didn't want to annoy you with the smell of the gasoline."

—*Acetylene Journal.*



SUCCESSFUL NEWARK CLUB.

Causes of Growth of New Jersey Automobile and Motor Club.

Special Correspondence.

NEWARK, Dec. 5.—A well attended and enthusiastic meeting of the New Jersey Automobile and Motor Club was held last Friday evening in the Newark Board of Trade Rooms. The treasurer's report showed a balance of more than \$1,500, and a membership of 200. The following were elected to honorary membership: Mayor Henry M. Doremus, of Newark; James M. Reilly, P. J. Murray, Benjamin Mayer, Joseph V. Clark and J. J. O'Connor.

It is expected that the question of joining the A. A. A., which was laid on the table, will be settled at the next meeting.

B. M. Shanley, Jr.; R. C. Jenkinson, and James M. Reilly were appointed to confer with the Road Horse Association in regard to the erection of a joint clubhouse near the new Speedway.

Secretary C. H. Gillette and Chairman of the Tours Committee Augustus Post, of the A. A. A., made an address showing what the association has done in the past, and advising the club to join, so that the New York and New Jersey clubs may be banded together to bring about the building of a suitable highway between Jersey City and Newark.

A committee was appointed to take up, with the Board of Trade and the city officials, the matter of improving the roads.

The board of governors held a meeting at the close of the club meeting, to make arrangements for a smoker to be held in the near future.

Although one of the youngest organizations of its kind, the growth of the New Jersey Automobile and Motor Club is considered marvelous, for the members have never had any meeting place except the rooms of the Newark Board of Trade, which they share in common with several other organizations, and, with the exception of a parade last spring, a club run one Sunday recently, and the race meet at Waverley Park last month, have done little that would be expected to attract new members.

There are two reasons for this rapid growth. One is the indefatigable efforts of the president, Frederick R. Pratt, who was elected last spring, and who has declared that he will not vacate his office next May, with a membership of less than 500. The other explanation is the club's policy, defined in the constitution, of co-operating to secure rational legislation governing the use of motor vehicles in city and country; to protect the interests of owners and users of automobiles against unjust or unreasonable legislation; to maintain the lawful rights and privileges of owners or users of all forms of self-propelled pleasure vehicles wherever such rights or privileges are menaced, and to promote and encourage in all ways the construction and maintenance of good roads and the improvement of existing highways.

The protection of its members from unjust persecution has taken precedence over everything else. Almost the first thing the club did was to retain a lawyer as its permanent counsel, at a salary, to advise the members whenever they get in trouble and to defend the suits that may be brought

against them, all without cost to them, provided the legal committee of the club, after examining into the circumstances of the case, conclude that the defendant is not to blame in the matter.

The first case which the lawyer was called upon to defend for a member was that brought by Wm. Fitzgerald against Wm. I. Fisk, a real estate dealer, and prominent member of the club, whose car collided with Fitzgerald on April 5 last while the latter was crossing a busy street in Newark. Fitzgerald suffered injuries more or less serious and immediately started suit for heavy damages. The case was tried before the Chief Justice of the New Jersey Supreme Court this fall, who granted a non-suit in favor of the defendant, declaring that Fitzgerald was guilty of contributory negligence in not looking well where he was going when he undertook to cross the thoroughfare.

As the outcome of the recent race meet, held by the club at Waverley Park track, B. M. Shanley, Jr., former president of the organization, tendered a mushroom dinner on November 30 to the officials who assisted in making the affair a success. Fourteen invited men journeyed twenty-five miles in four cars to the Maison Pidefour, where the dinner was served. On board of Mr. Shanley's 90-horsepower Mercedes was President Frederick R. Pratt, Dr. English, and Secretary C. S. Wells. W. C. Shanley, in his Decauville, carried P. G. Murray, J. W. Mason and J. H. Wood. W. V. Snyder, in a Peerless, had with him R. T. Newton and J. H. Dawson. In another Decauville R. H. Burt had J. V. Clark, James Reilly and J. J. O'Connor, Jr.

After the repast several hours was spent in relating stories on motoring. It was also decided to continue to hold the race meets at Waverley.

A contingent of motorcycle members of the club, held a race meet of their own last Saturday at Waverley Park. Only three machines were entered and two events run off, both for ten miles. The two races were won by Allen Reid, on a 4-horsepower Orient, the time for the first race being 15:30 and for the second, 16:30. The trials were so successful that similar races will be held next year.

NOTES OF THE CLUBS.

BROOKLYN.—The annual dinner of the Long Island Automobile Club will be held on December 21 at the new clubhouse, 360 Cumberland avenue, Brooklyn.

NEWARK.—At the annual meeting of the Physicians' A. C. of this city, to be held soon, plans are to be discussed by which the Newark club can be made into an international body. Such a step has been contemplated because of inquiries received from Paris and London about the objects of the club and the interest shown in its welfare by automobilists living abroad.

NEW YORK.—On account of the destruction by fire of the plates used in printing the maps issued to members of the A. C. of America, new ones will be prepared at once, and will embrace revisions and corrections of the errors in the first edition of these maps. Members are urgently requested to forward at once to the club secretary any corrections which they deem necessary, and also to send full and detailed descriptions of any good routes in the territory covered by the old maps, as well as in the area north

and south of the central New Jersey section published this year. Maps of southern and northern New Jersey, and the adjacent parts of Pennsylvania, Delaware and New York are in preparation, and are to be issued to members on or about May 1.

CHICAGO.—At the recent monthly meeting of the Board of Directors of the Chicago Automobile Club the following applications for membership were favorably acted upon: Joseph Beifeld, William Howard Hoops, William Herrick and Benjamin S. Walker.

NEWARK, N. J.—The regular meeting of the A. C. of New Jersey was held at the clubrooms in Harrison avenue, East Orange, on December 1, when the result of the recent Eagle Rock hill climbing contest was discussed. Secretary Gillett's report was gratifying from a financial point.

NEW YORK.—Hon. Leroy B. Crane, a city magistrate who has come into a good deal of prominence because of his reported strictness against automobilists brought before him charged with excessive speeding, is announced to deliver an address on "The Automobile and the Magistrate" before the Automobile Club of America, at its Tuesday evening meeting, December 13.

LONDON.—The Ladies' Automobile Club of Great Britain and Ireland has arranged for a course of six lectures to be given to its members on the internal combustion engine, as applied to self-propelled vehicles. The lectures commenced on November 22 and will be concluded on January 24. Mr. Sedgwick Currie, who is consulting engineer to the Ladies' A. C., will give the addresses.

BERLIN, Germany.—The German Automobile Club will shortly move from its present premises at 4a Sommer Strasse, Berlin, to 16 Leipziger Platz, a house belonging to Dr. James von Bleichroeder, which the club has acquired at a very reasonable sum. The suite of rooms at the Sommer Strasse proved too small for the steady growth of the club. Dr. von Bleichroeder is a leading member of the organization.

PITTSBURG.—The Pittsburg division of the American Motor League has arranged for new winter quarters on the second floor of the Hiland garage, on Beatty street. The officers are already planning to get reduced railway rates for the New York Show, and it is probable that at least 100 motorists will take advantage of this to visit the Madison Square Garden event and also the Automobile Salon of the dealers in foreign cars.

PHILADELPHIA.—On Tuesday morning last, at the residence of the bride's parents, H. Bartol Brazier, the popular secretary-treasurer of the A. C. of Philadelphia, was married to Miss Annie E. Milne, daughter of Mr. and Mrs. Francis F. Milne. The groom's clubmates were prominent among the guests, several of them assisting in the ceremony in the capacity of groomsman or ushers. After the wedding breakfast Mr. and Mrs. Brazier left for the south on a fortnight's wedding trip.

BUFFALO.—At a meeting of the A. C. of Buffalo, held last Wednesday, William H. Hotchkiss announced his intention of retiring from the presidency at the expiration of his present term. An election of officers is to be held December 19, and Augustus H. Knoll was nominated for president. Other nominations are as follows: Vice-President, H. A. Meldrum; secretary, D. H. Lewis; treasurer, Col. Charles Clifton. The board of governors for the ensuing year will be composed of Edward H. Butler, E. R. Thomas and W. H. Baker. President Hotchkiss has received from Assistant State Engineer Rockwell, at Roch-

Current News From New York.

ester, a fine map of New York State, showing every road west of Utica. This has been framed and hung in the club rooms. On the map is a detailed description of every road shown and other general information of value to automobile tourists.

PITTSBURG.—The A. C. of Pittsburg is making every effort to make the winter as enjoyable to its 250 members as the summer and fall were. A hockey team has been organized among the following members, who are expected to become experts in a short time: A. E. Mashey, T. F. Dunn, D. P. Collins, A. L. Banker, Charles Rowe, Richard Pollard and Ralph Clemson. The men will be assigned positions in a few days and the team will compete with various business men's clubs this winter.

NEWTON, Mass.—Seventy members and guests of the Newton A. C. attended the first annual banquet of the club, held last Wednesday evening at the Newton Club, in Newtonville. Among the guests were President Harlan W. Whipple, of the American Automobile Association; President Elliot C. Lee, of the Massachusetts Automobile Club; Alexander Winton, of Cleveland, and Hon. Samuel L. Powers, Congressman from the district that includes Newton. President William M. Ferris presided, and the after-dinner speaking was more or less informal. The guests spoke generally upon the use of automobiles and related some of their experiences. Local speakers outlined briefly the efforts that are to be made at the incoming legislature to have some of the restrictions on automobiles repealed, and to have good roads extended to some parts of the state where they do not at present exist.

BOSTON.—The committee of the Massachusetts Automobile Club, which has had in charge the arrangements for a housewarming of the enlarged clubhouse, have decided that the event shall take place next Friday evening. The extension was completed and occupied and was opened early last summer on the day the Boston contingent of the A. A. A. St. Louis tour left this city. Since then it has been in use constantly, but there has been no formal dedication. The committee in charge of this function consists of Stephen Sleeper, Harlan W. Whipple and Dr. J. C. Stedman. The exercises will begin at 6.30 o'clock with dinner, which will be followed by an entertainment, a reception and a late lunch. It is expected that a large number of automobilists who belong to the club will attend the housewarming, and the event will be a sort of reunion of local enthusiasts. The building is three stories high and has a frontage of 120 feet on Boylston street, with a depth of about 100 feet. There are two entrances for cars and separate entrances for the office and the ladies' apartment on the ground floor. The second and third floors of the old clubhouse are used for club purposes, but all the space in the addition is used for the storage of cars and for the machine shop.

EXPORTS OF AUTOS AND PARTS.

Automobiles and parts of same to the value of \$130,891 were exported from the United States during the month of October, 1904, as compared with similar exports aggregating \$119,131 in the same month a year ago, showing an increase of \$11,760.

For the ten months ending with October, 1904, the exports totaled \$1,576,877, as compared with \$1,311,960 for the same period in 1903, representing an increase of \$264,917.

An express motor-omnibus and parcel delivery service has been established in the Isle of Wight.

One American Gordon Bennett candidate has appeared. Dr. H. E. Thomas, of Chicago, has entered his Locomobile racer, an entirely new 90-horsepower car designed by A. L. Riker, the engineer of the Locomobile Company of America. The machine, which is not yet completed, is building after the general design of Locomobile touring cars, and is not radical in important features. Though the entry list closes on December 15, and only one entry is as yet on the books, no doubt seems to exist in the minds of the A. C. A. officials concerning the making up of a team, owing to the American habit of deferring entry until the last week—or even the last hour.

The old plank road between Jersey City and Newark, N. J., is to be repaired, or rather rebuilt, and widened to 100 feet. Doubt exists, however, concerning the proper paving to lay, and arrangements for commencing the work cannot be made until this point is settled. From Newark fine macadamized roads radiate in all directions, and poor roads are almost unknown; but the two shortest routes to Newark from New York city—the plank road and the Arlington Pike—are in very bad condition. New Jersey automobilists, while glad that the plank road is to be made usable, are anxious to see the Arlington Pike put in good condition, and are quietly working to have this done.

At the last meeting of the Executive Committee of the National Association of Engine and Boat Manufacturers it was decided that sanction would be granted for only one show during 1905. That will be the one to be held in conjunction with the Sportsmen's Show in Madison Square Garden in February. For that occasion, water space has been reserved for the boats and has almost all of it been sold. As this is the first national power-boat show, the interest taken insures a most interesting exhibition of this industry.

Hold-ups of automobilists, conducted in the customary manner, have grown almost commonplace and unworthy of much comment; but interest has been aroused anew by a novel hold-up game played by a few clever rascals near Belleville, N. J. It is reported that two men, wearing what appeared to be police badges, held up several automobilists, took them before a bogus judge deep in the woods, with a box for a bench and another for a desk, who fined them handsomely under the greenwood tree. There is a warm time awaiting these geniuses—when they are caught.

The Pipe car, of Belgian manufacture, is now represented in this country by Joseph S. Heller, with headquarters at 123 West Fifty-second street, New York city. Mr. Heller says that, having secured the exclusive agency for this machine for the United States, Canada, Mexico, Central America and the West Indies, he will establish sub-agencies as may be required. A Pipe racing car will, he says, be entered in the Florida tournament. Concerning the adaptability of the Pipe car for American roads, it is stated that the Belgian roads are, for the most part, exceedingly rough, testing the strength of a car very severely. A 15-horsepower machine has arrived and will be exhibited at the Importers' Salon, where space has been secured. It has a limousine body, with luxurious appoint-

ments for six passengers, including electric lighting, folding table and other features making for comfort and convenience.

Another fresh importation for the Salon is a Delahaye car of 30 horsepower, with Cape cart hood. The American agent for this car is L. J. Caugler.

The Union Motor Supply Company, with headquarters at 1 West Thirty-fourth street, New York city, which was incorporated recently with Baron Frederic de Turkheim as president, J. J. Bradley vice-president, and R. E. Jarrige, treasurer and manager, will handle automobile supplies and accessories of all kinds, but not complete cars. Foreign goods will be imported and American goods exported. Branch offices will be established at once in Paris and Berlin, and later in other European centers.

The Automobile Club of America will be represented by Clarence Gray Dinsmore at two conferences in Paris, one to be held on December 10 and the other on December 12. Gordon Bennett race matters, including the proposed changes in the conditions, will be discussed at the first conference, and automobile matters in general at the second.

In view of the wholesale destruction of automobiles by the burning of the Standard garage on Monday, the announcement of Beardsley, Stiles & Co., 22 Clinton street, Newark, N. J., regarding automobile insurance should be of interest to automobilists. This firm states that it issues fire insurance policies covering damage by fire from any cause whatever, and good in any part of the United States, as well as accident and liability policies.

The 80-horsepower De Dietrich racing car that took part in the Vanderbilt Cup race, driven by Gabriel, has been purchased by O. F. Thomas, of New York, a cousin of E. R. Thomas. The car will be raced in the Florida tournament, and will be driven by an American driver, Fletcher. There promises to be keen friendly rivalry between the two cousins for supremacy in the automobile racing game. The American De Dietrich Company, of New York, will also enter a De Dietrich racer for the Florida events, and efforts are being made to arrange to have Gabriel come to this country to drive the machine, which will be almost a duplicate of the one sold to Mr. Thomas.

The Harrolds Motor Car Co., organized to handle the Oldsmobile and Pierce automobiles, with Harry Unwin, formerly secretary of the N.A.A.M. and later with the Olds Motor Works, at the head, has secured quarters in the Journal Building, Columbus Circle, New York, and the work of fitting up the place is progressing actively. A complete stock of Olds and Pierce cars will be carried, and the salesroom is intended to be a model of its kind. Every car will undergo a thorough cleaning before being placed on the floor, and under each will be placed a plate glass mirror so that the car can be examined readily. Accessories and supplies will be carried in stock as well as automobiles. R. G. Howell, who is closely identified with the Oldsmobile in New York city, has been retained by the Harrolds company.



The Kokomo Electric Company has been incorporated at Kokomo, Ind., for the purpose of manufacturing a full line of high grade electric ignition apparatus for gas engines, including spark coils, both jump spark and primary, storage batteries, dynamos and magnetos, spark plugs, commutators and timing devices, switches, wire terminals, etc. This company has purchased the factory and plant of the E. S. Huff Company, of Detroit, moved it to Kokomo, and added a large amount of new machinery, making it one of the best equipped factories of its kind in the country. A large amount of the stock of the Kokomo Electric Company is held by members of the firm of Byrne, Kingston & Co., who will handle the entire output of the new plant. George Kingston, general manager of Byrne, Kingston & Co., will also manage the Kokomo Electric Company, with E. S. Huff as electrical engineer. The output of this factory, which is already in operation, added to the line of carbureters, mufflers, circulating pumps, oiling devices, steering wheels, etc., of their own manufacture, will give Byrne, Kingston & Co. one of the most complete lines of accessories marketed in the United States.

The retail business of the E. R. Thomas Motor Company, of Buffalo, will be handled next season from the main factory, 1,190 to 1,200 Niagara street and the motorcycle business from factory No. 2, at 1,413 to 1,421 Niagara street. Both of these factories at the present time are being operated day and night and deliveries of the new models are being made daily. "Cal" Paxton, who had charge of the Thomas exhibition at the St. Louis exposition, will have charge of the retail department. The company will continue to market its three-cylinder model with the same improvements in engine and body as characterize the 40-horsepower four-cylinder model.

The Hartford Rubber Works Company is laying a foundation for future new business in Philadelphia just now. Ever since Friday last "Teddy" Edwards and W. R. Barnes have been showing the local automobile public how easily the Dunlop detachable tires can be manipulated. Many persons have witnessed these demonstrations, which were held Friday at the Tioga Automobile Station and at Wanamaker's Station, and on Saturday at the Quaker City Automobile Company's establishment. Monday the demonstrations were held at the garage of the Pennsylvania Electric Vehicle Company.

One of the women who do not consider the management of a gasoline automobile beyond their ability is Mrs. Catherine Baker, of Dayton, O., who takes solitary trips in her Haynes-Apperson runabout and occasionally ventures upon journeys of considerable length. Mrs. Baker recently made a round trip between Dayton and Kokomo, Ind., in her car, the total distance being 300 miles. The only trouble experienced was caused by the picking up of a pebble which broke the driving chain. Repairs made it necessary to take part of a second day to finish the first 150 miles, the return trip being completed in one day.

The Eastern Automobile Co., with headquarters at Philadelphia, has been organized by the following incorporators: M. E.

Brigham, A. B. Cumner, George T. Thompson, H. K. Buck and J. R. Maynes. Temporary offices are now located at 712 Girard Trust Building, but it will at an early date occupy a thoroughly equipped and centrally located garage and salesroom. The new company has secured the exclusive agency for the Philadelphia territory for the Peerless and Stevens-Duryea cars, and will add still another machine to complete its line.

The Reo Car Co., of Lansing, Mich., is busily engaged in preparations for manufacturing on a large scale, and sales manager R. M. Owen, who has recently returned from a visit to the factory, states that 3,000 machines will be turned out of the works during 1905. The factory itself is completed, most of the machinery has been installed, and material for automobile construction is arriving in large quantities. Twenty cars a day will, it is said, be the output of the works immediately after the New York automobile show.

Notwithstanding a recent investment of nearly \$30,000 for additional machinery, and the night operation of the plant up to 9 o'clock all through November, the Packard Motor Car Company, of Detroit, began work last week on a second floor addition to the north wing of the factory. This work is to be rushed to completion and when done will afford an additional floor 326 by 60 feet, or 19,560 square feet. This room is to be used to relieve pressure on several departments, especially on the painting and upholstering departments.

The Orange Automobile Garage has been organized at Orange, N. J., by Frederick C. Hinni, Jr., a graduate mechanical engineer, and R. Arthur Heller, a graduate of Columbia University, to deal in automobiles and automobile supplies. The new firm is equipped to give especial trained attention to expert repair work in addition to storing all kinds of vehicles and charging electric vehicles. A specialty will be made of repairing foreign cars.

The New York & New Jersey Lubricant Co. writes that Messrs. Anderson & Price, proprietors of the Ormond Hotel, have decided to furnish exclusively N. F. O. gas engine cylinder oil and non-fluid oils during the January races of the Florida East Coast Automobile Association. These lubricants were supplied exclusively during last winter's tournament and also during the Mt. Washington climb to the clouds last summer.

Among the recent changes in the Chicago automobile trade is the consolidation of F. J. Pardee, of Pardee & Co., who have handled the Packard cars in Chicago for the past four years, and Henry J. Ullman, who handled the White steamers for the past season. The new firm will be known as the Pardee-Ullman Company, and will handle both Packard and White machines.

In order to meet the increased demand for its cars, the Premier Motor Manufacturing Co., of Indianapolis, Ind., has doubled its capital stock, and now has under construction a new and larger factory, which it expects to occupy early in January. This will enable the company substantially to increase its output for 1905.

A two-story brick building is being erected on Michigan avenue, between Twelfth and Thirteenth streets, Chicago, for Orlando F. Weber's salesrooms and garage. Mr. Weber handles the Pope-Toledo cars, and is at present located on Wabash avenue, but expects to remove to his new quarters about January 1.

Preparations are now being perfected by the Automobile Club of Sweden to hold an automobile race meet next February on the ice of a river near Stockholm, the races to include many different classes. Owners of racing machines of other countries will be invited to take part in the contests.

Leading manufacturers of American automobiles who are desirous of placing their cars in foreign markets are invited to forward their catalogues to Earl Gilberto Arrivanhene, at the Palazzo Papadopoli, Venice, Italy.

The Miller-Knoblock Electric Manufacturing Co., of South Bend, Ind., has been succeeded by the Knoblock-Heideman Manufacturing Co., and the business will be continued as formerly.

The Truffault-Hartford Suspension Co., of 67 Vestry St., New York city, has been incorporated under the name of the Hartford Suspension Co., the address remaining the same.

The Chicago Automobile Exchange will handle the Ford cars for 1905. The Chicago agency for this machine was formerly held by the Illinois Motor Co.

James S. Levy, of the Mead Cycle Co., has secured the Chicago agency for the Autocar for 1905.

RECENT INCORPORATIONS.

De Mars Electrical Vehicle Co., Cleveland, O.; capital \$25,000. Incorporators, William O. De Mars, Charles Wilson Baker, John R. Blakeslee, Sr., Harry J. Gibbons and A. M. Barnes.

Auto Garage and Electrical Construction Co., Zanesville, O.; capital \$5,000. Incorporators, C. A. Rosa et al.

Union Motor Supply Co., Manhattan, N. Y. C.; capital \$25,000. Incorporators, Rene E. Jarridge, Jesse J. Beitler, Frederick C. Turckheim, all of Manhattan.

Harrolds Motor Car Co., Manhattan, N. Y. C.; capital \$30,000. Directors, Edward J. Steiner and Edward Brand, of New York, and Harry Unwin, of Detroit, Mich.

Curtis Automobile Co., Brooklyn, N. Y.; capital \$1,000. Directors, Charles G. Curtis, Van Wyck Curtis and Alice W. Curtis, all of Brooklyn.

Motor Supply Co., Yonkers, N. Y.; capital, \$1,000. Directors, David M. Harvey, William C. Dodge, of New York city, and P. F. W. Ruther, of Brooklyn.

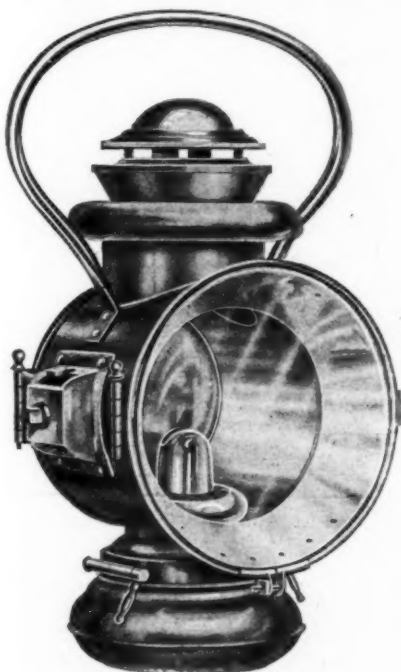
Cahill Automobile Co., of Washington, D. C.; capital, \$5,000; to conduct automobile storage and repair business, including the buying and selling of machines. Incorporators, Frank S. Cahill, Wm. S. Duval and A. E. H. Middleton.

Rapid Motor Vehicle Co., Detroit, Mich.; capital, \$100,000. Incorporators, Albert Marx, Barney Finn, Delia Grabowski and Max Grabowski.

INFORMATION FOR BUYERS.

AUTOMOBILE LAMPS.—A complete line of automobile lamps, both oil and gas, is manufactured by the John Brown Mfg. Co., of Columbus, O. A catalogue giving illustrations and detailed descriptions includes lamps with generators attached, lamps for use with separate generators, swivel searchlights and oil lamps for side and tail lights. Lens mirror reflectors are used in the larger sizes. In addition to lamps, the Pilot generator is manufactured by the company. This is made in three sizes, for one, two or three lamps.

KEROSENE AUTO LAMPS.—The C. T. Ham Mfg. Co., of Rochester, N. Y., is turning out a line of kerosene lamps for automobiles which are called Cold Blast lamps. The manufacturers announce that they have produced a lamp of exceptional strength, and one that will give a brilliant light, burning kerosene, and will not blow out in the teeth of the strongest wind. Other good qualities claimed for the Cold Blast lamps



"COLD BLAST" OIL SIDE LAMP.

are simplicity and accessibility of all parts for cleaning and filling, sufficient oil capacity for 24 hours' continuous burning, glass-covered reflector, and absence of smoke and odor. Brass, copper or nickel trimmings will be supplied, as desired, or lamps may be full nicked or enameled black and trimmed with nickel.

HANDLING GASOLINE.—The process of transferring gasoline from the storage reservoir to the tank of the automobile is always a more or less disagreeable task, and, besides, is a source of danger and waste. There are also numerous opportunities for the intrusion of dirt and, under certain conditions, for the admission of water. To obviate these features as much as possible the Tokheim Mfg. Co., of Cedar Rapids, Iowa, is manufacturing a line of gasoline-handling appliances designed to keep the fuel clean and free from water, prevent evaporation and waste, to keep the gasoline and automobilist from coming in contact with one another, and to save time. With the Tokheim system the gasoline is stored in a reservoir, placed wherever

most convenient, outside or inside the building, and piped to a pump installed at the point where the gasoline is to be delivered. A hose runs from the pump to the tank in the car. In order that the amount of gasoline delivered may be known, the column which carries the pump is surmounted by a glass dome, graduated in gallons and fractions. The pump is worked until the gasoline rises in the dome to the desired mark, when a cock in the pipe leading to the hose is opened, and the amount indicated by the mark on the dome runs into the tank. If too much is pumped into the dome part may be returned to the reservoir by raising the pump handle, the opposite motion stopping the return flow. For the use of dealers and garages the dome is marked with prices as well as quantities, so that both figures may be ascertained at a glance. Any dirt in the gasoline may be seen and drained out while the fluid is in the glass dome.

AUTOMOBILE JACKS.—The Searles jacks, made by the Jersey Brake Co., Newark, have been improved in several respects for the season of 1905, and the manufacturers have issued a sheet illustrating and describing these appliances with the late improvements. The Searles jacks when unfolded for use has a broad base to stand on, making them steady under load, while they occupy little space when folded. They are made in sizes suitable for cars or motor trucks of any weight.

SCANDINAVIAN FURS.—It is but natural that a people living within the Arctic circle should know something about the treatment of the furs and leathers necessarily used by them as a protection from the intense cold of the winters of the far North, and it is not strange that the skins cured by them should be found excellent for the making of winter garments for automobilists. The Scandinavian Fur and Leather Co., at 16 West 33d St., New York city, shows a splendid assortment of automobile clothing made from furs and leathers tanned by the Scandinavian methods. The softness and pliability of the material are remarkable, and these qualities make it possible to cut and fit the clothing almost as exactly as could be done with cloth. Lightness is another feature that is worthy of note, and the water-shedding qualities of the leather are said to be perfect. Not only are the usual jackets, coats and other outer

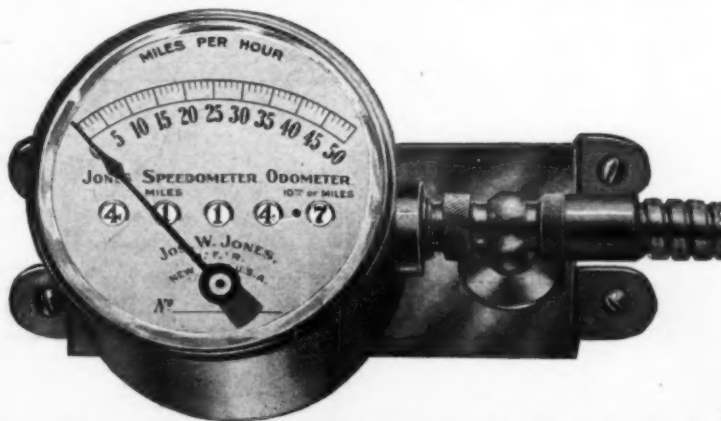
fabrics, are readily produced. Even the prevailing fashions in sleeves are readily reproduced. Furs of many kinds are shown, made up in various effective combinations.



SCANDINAVIAN COMPANY'S FUR GARMENTS.

Among the goods to be seen at the company's store can be found almost everything one can think of that can be made of leather or fur for the automobilist. There are goods to fit all sorts of purses, the coats, for instance, ranging in price from \$12 to \$3,000. Two comfortable looking fur outfits are shown in the accompanying illustrations.

SPEEDOMETER AND ODOMETER.—The manufacturer of the well-known Jones speedometer, Joseph W. Jones, 129 West Thirty-second street, New York city, has brought out a new instrument, a speedometer and an odometer combined in one case. It is of the same size as the standard Jones speedometer, with 3-inch dial, and under the scale of miles per hour is the usual arrangement of indicating figures found in odometers, registering up to 10,000 miles in miles and tenths. Fifty miles an hour is the range of the speedometer dial. Flexible shaft and gear drive, similar to that on other Jones instruments, is used. An



JONES COMBINATION SPEEDOMETER AND ODOMETER FOR ATTACHMENT TO DASH.

garments made of Scandinavian leather, but vests, ladies' skirts, close-fitting jackets and garments, usually made only of woven

attractive little catalogue describes the complete line of Jones speed and distance-measuring instruments.

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